THE POLITICAL ECONOMY OF SOUTH AFRICAN INDUSTRIALISATION

- THE ROLE OF THE MINERALS-ENERGY COMPLEX

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ABSTRACT

This thesis provides an original interpretation of the trajectory of South Africa's post-war industrialisation by emphasising the role played by the economy's Minerals-Energy Complex (MEC).

The MEC is viewed as a system of accumulation, encompassing a number of core economic sectors and imparting a determining influence on the pattern of industrialisation and economic performance. The development of the MEC has been mediated by relationships between English and Afrikaner fractions of capital through the state, giving rise to a conglomerate form of private and public corporate structure, straddling the mining, manufacturing and financial sectors.

By examining the MEC empirically, through primary and secondary material from the inter-war period to the present day, it is shown that past debates over the rhythm of industrialisation have been based, both on a false perception of the pattern of (import-substituting) industrialisation and on a partial and even false recognition of how industrial policy has been adopted and implemented. Contrary to conventional wisdom, there was capability in capital goods and other industries in and around the MEC but their potential scope has not been exploited through coherent industrial policy.

In the 1950s, efforts at diversification were hampered by the objective of creating large-scale Afrikaner capital. Foreign disinvestment after 1961 opened new opportunities for domestic investment, while the disjuncture between

large-scale English and Afrikaner capital narrowed as the former assisted the latter to enter gold mining and as further interpenetration between the two occurred. Policies of strengthening the MEC followed the gold and energy price rise in the 1970s, while the crisis of the 1980s precluded policies of industrial diversification from being implemented. Consequently, the industrial structure and institutional impetus that represent the MEC continue to guide South Africa's industrial trajectory into the 1990s.

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ACKNOWLEDGEMENTS

In 1988, in a diversion from a career in engineering, I enrolled on the thirteenth MPhil (Development Studies) programme (MP13) at the Institute of Development Studies, University of Sussex to broaden my understanding of development and, particularly, the role of industrial development. Intellectually, and in chronological order, I owe much to the numerous IDS Fellows, friends and colleagues in MP13. But, in particular, my thanks go to Raphie Kaplinsky who continually challenged, and ultimately helped me to erode, a very deterministic streak in my approach.

This thesis is in part the off-shoot of research undertaken under an ESRC-funded research project entitled "The South African Minerals-Energy Complex and the Capital Goods Industry". The thesis has been based on the material produced during the research and in subsequent participation in the Industrial Strategy Project, ISP, with whose members I engaged in many debates and disagreements.

My thanks go to colleagues in the Economics Departments of SOAS, in particular, those in the Centre for Economic Policy for Southern Africa (CEPSA), for both academic and non-academic stimulation. Participation in the CEPSA "salsa" club considerably enhanced my academic performance! Thanks also go to colleagues at the University of the Witwatersrand for providing me with a base from which I could carry out my fieldwork.

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INTRODUCTION

This thesis provides an original interpretation of the trajectory of South Africa's post-war industrialisation by emphasising the role played by the economy's Minerals-Energy Complex (MEC). The MEC is viewed as a system of accumulation, encompassing a number of core economic sectors, which has imparted a determining influence on the pattern of industrialisation and on economic performance.

A number of broad assumptions have been made in this thesis. The most important concern the theoretical stances adopted (respectively) towards the state and towards industrialisation. While no theory of the state is explicitly adopted, it is generally viewed as being responsive to class forces and influenced by the balance of political and economic power at any given point in time. The theoretical stance adopted toward the process of industrialisation is also not made explicit. However, it is generally located within a political economy framework which is informed by a number of analytical and theoretical concepts, lying within the terrain of political economy.

While some of these concepts are "tested" against the process of South African industrialisation, the objective of the thesis is less concerned to confirm or to reject specific theories than to unravell the specific processes through which industrialisation has materialised in South Africa. For both the state and the process of industrialisation, the theoretical stance has drawn implicitly (in exposition) from recent analyses of the role of the South Korean state and its relationship with capital in South Korean industrialisation.

Much of the material contained here was compiled during a two-year, ESRC-funded research project entitled

"The South African Minerals-Energy Complex and the Capital Goods Industry". There are several common themes that are traced throughout the thesis, which is written in six self-contained chapters and, therefore, some repetition has been unavoidable.[1]

The more general contribution of the MEC to the economy through its core sectors and its shifting sectoral boundaries are outlined in Chapter 1. Through an analysis of input-output linkages, conventional economic categories of industrial sectors are found to be misleading in interpreting the pattern of industrialisation in South Africa. It is shown that mining, energy and a number of associated sub-sectors of manufacturing have constituted, and continue to constitute, the core site of accumulation in the South African economy. Contrary to the apparent declining role of "mining", the economy's dependence on this MEC core has, in fact, increased.

The development of the MEC has been mediated by relationships between English and Afrikaner fractions of capital through the state. These have contributed to the emergence of a specific conglomerate form of corporate structure both private and public, which straddles the mining, manufacturing and financial sectors. Chapter 2 outlines this peculiar form of corporate ownership for the private sector, demonstrating how conglomerate ownership and control are distributed sectorally and reproduced at the level of the financial sector.

While acknowledgement of concentrated ownership of capital in South Africa is not novel, the approach adopted here is to view the process of increasing conglomeration and centralisation as both a product of the economy's historical evolution around the MEC as well

[1] Chapter 1 was published as Rustomjee (1992). Chapters 3, 4 and 5 were based on joint work carried out with Ben Fine at SOAS, as Fine and Rustomjee (1992), (1993a), (1993b) and (1993c) respectively.

as having itself contributed to shaping that evolution. Chapters 1 and 2 are essentially descriptive in nature and should be interpreted as introductory to Chapter 3. For the MEC should be viewed, less as a set of economic and institutional linkages and more as a system of accumulation. Chapters 3 and 4 trace this process during the inter-war period and across the post-war period, respectively.

In Chapter 3, economic policy in South Africa in the inter-war period is discussed in the context of differences between the economic power and political influence of "Afrikaner" as opposed to mining or "English" capital. Previous analyses are shown to have been limited by over-generalisation, narrowness of scope, and analytical methodologies which have overemphasised class agencies at the expense of actual and potential economic linkages.

While interventions by the state varied across sectors, including protection, other forms of subsidy and the creation of a state sector around heavy industry, policies were not cohesive enough to diversify extensively out of the economy's mineral base. Despite this, constrained industrial diversification did occur in isolated cases, including chemicals and industrial diamond products, suggesting that other development trajectories could have been possible. This is taken up in Chapter 6, where the relationship between the MEC and the South African engineering industry is explored.

Chapter 4 advances this analysis into the post-war period. It is shown that, despite the development of some significant individual industries, and despite the conventional wisdom that South Africa has achieved substantial import-substituting industrialisation through protection, the trajectory of industrialisation was effectively centred on the core MEC sectors. In the

1950s, efforts at diversification were constrained by the creation of large-scale Afrikaner capital which was subsequently deployed within the MEC core. In the 1960s, foreign disinvestment opened new opportunities for domestic investment and diversification. But as growing interpenetration between large-scale English and Afrikaner capital increased, the potential for diversification diminished, for example, as the former assisted the latter to enter gold mining. In the 1970s, following the gold and energy price rise, extensive and coherent policies to strengthen the MEC core were adopted, while the crisis of the 1980s precluded policies of industrial diversification from being implemented. Consequently, the industrial structure and institutional impetus that is based on the MEC has continued to guide South Africa's industrial trajectory into the 1990s.

In Chapter 5, the process of industrial policy formulation is reviewed through an examination of the conduct and role of two key institutions, the Industrial Development Corporation (IDC) and the Board of Trade and Industry (BTI). Here, it is demonstrated that the industrial policies that were actually pursued followed a separate path from the recommendations emanating from the many official Commissions of Inquiry into industrial development. It is argued that the reasons for this are bound up with the over-riding role of the MEC as a system of accumulation which, for a variety of reasons that differed over time, precluded the adoption of industrial policies of diversification away from economic dependence on South Africa's MEC base.

Such policy conduct was accompanied by a historiography which interpreted post-war industrial performance and the pattern and determinants of industrial diversification as a movement away from the mineral base of the economy. These debates are reviewed and counterposed, firstly, with the practice of policy

implementation as outlined and, secondly, with the evolution of the MEC. The debates are shown to have changed in parallel with more general developments in the theory of industrialisation and development. But, it is argued that past debates over the rhythm of industrialisation have been based, both on a false perception of the pattern of industrialisation and on a partial and even false recognition of how industrial policy has been adopted and implemented.

Firstly, a false dichotomy has been drawn by both policymakers and in the literature between "mining" and "manufacturing" activities, masking the evolution of the MEC that straddles both. Secondly, the commonly accepted past and prospective trajectory for import-substituting industrialisation (ISI) is shown to be contrary to the actual pattern of post-war industrialisation in South Africa whereby, in reality, heavy (producer goods) industries grew in parallel with the supposedly "easy" light (consumer goods) industries.

Thus, contrary to ISI logic, South African industry is shown to have demonstrated a considerable capital goods capability, and this is drawn out in more detail in Chapter 6. Yet, despite this capability, engineering industries are shown to have remained dependent on MEC core sectors. The reasons for this are attributed to complex relations of conflict and collusion between Afrikaner and English capital leading to industrial policies which were insufficiently coherent to diversify engineering away from the MEC core. Seen in this light, the success of those individual engineering firms achieving such diversification represents the latent potential of industrial development in South Africa, which has been impeded by the system of accumulation around the MEC.

Chapter 7 concludes with some implications of this thesis for the future trajectory of industrialisation. As a system of accumulation, the MEC has been shown both institutionally and sectorally to have confined the industrial trajectory of the South African economy to a narrow core of industries. The accompanying growth of large-scale capital, and its dominance of most economic activity in South Africa through a particular conglomerate form, has contributed to impeding the industrial diversification. Potentially, it also forms the basis for considerable diversification, growing out of the strengths already identified. Policymakers will thus have a difficult task in challenging the power of the conglomerates to carry through this process such that it begins to address the needs of those most affected by the legacy of apartheid.

CHAPTER ONE

THE BOUNDARIES OF THE SOUTH AFRICAN MINERALS-ENERGY COMPLEX - THE IMPLICATIONS FOR MANUFACTURING LED GROWTH STRATEGIES

INTRODUCTION

Foremost in the minds of politicians, economic planners, the corporate sector and the labour movement is the dualism of the South African economy. On the one hand, there is a relatively well-developed industrial core with supporting infrastructure and, on the other, an underdeveloped periphery. Even before the completion of negotiations over the abolition of apartheid, the problems of development have occupied centre stage.

At present, several concurrent debates are continuing. First, there is the overarching and rather sterile debate over state intervention versus market forces. A second area is around export orientation of the economy versus an orientation that addresses basic needs. A third is whether emphasis should be on urban or on rural development.

However, many of these debates are conducted in the absence of rigorous concrete analysis. Many studies of industry and industrial development fail to look behind the aggregate statistics and, therefore, result in rather superficial analyses which are somewhat misleading. The perception of a declining mining sector and a largely protected and inefficient manufacturing sector is the conventional starting point. Here the problem is perceived to be the difficulty of shifting the basis of accumulation and economic activity away from mining to dynamic, competitive and employment creating segments of

the manufacturing sector, while retaining macroeconomic and fiscal balances.1

This chapter shows that the South African economy's current strength lies in what is termed a Minerals-Energy Complex (MEC), which includes the mining, energy and a number of associated sub-sectors of manufacturing. These sectors have constituted and continue to constitute the core site of accumulation in the South African economy.2 By taking account of the systemic linkages between these different economic activities, the direct and indirect dependence of the entire economy on the MEC is exposed. Contrary to the apparent declining role of mining, the economy's dependence on this MEC core has, in fact, increased, posing a rather different challenge, namely, to shift the basis of accumulation towards non-MEC manufacturing sectors.

Section one uses a conventional input-output approach to examine the more visible backward and forward linkages between mining and manufacturing sub-sectors, their respective contributions to GDP, exports, employment and their import propensities. Section two identifies the specific sub-sectors of manufacturing that constitute the MEC and justifies the MEC concept largely in terms of the material flows between the various sub-sectors. In the process, traditional categories of "Mining and Quarrying" and "Manufacturing" are redefined. The role of the MEC in the economy is analysed through

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1 See, for example, BTI Annual Report, (1990, p.4), IDC Annual Report, (1990, pp.5-6), IDC (1990), Sacob (1991, pp.11-13, 61-63) and ANC (1992). In January 1992, COSATU embarked on an 18 month Industrial Strategy Project which examines 15 manufacturing sub-sectors precisely in order to provide policy guidelines for industrial restructuring.

2 As a starting point, this chapter focuses on relatively static structural linkages that characterise the MEC. It does not examine the agencies which influenced the manner in which such linkages emerged, such as corporate structure, patterns of ownership, labour supply and control, management interlocks, technology, trade, manufacturing and mining associations (of which the Chamber of Mines is the most prominent) relationships with state agencies, state policies, social and class struggles, and external and other factors which have influenced the patterns of development. Some of these more dynamic and historical aspects including the linkages and institutions which govern financial flows of capital, profits, taxes and wages, will be covered in other chapters.

macroeconomic indicators, sketching the institutional fabric that supports the MEC, linking it to other economic agencies, such as labour, the state and capital. Past policies are shown to have strengthened the MEC. Section three shows that the current debate on post-apartheid industrial policy does not take account of the centrality of the MEC. The reasons for the central position of the MEC in the economy cannot be explained through input-output analysis but the MEC can be regarded as the result of deliberate state intervention to support the centralisation and concentration of specific fractions of capital.

There are two important ways that the MEC's future trajectory can be interpreted. First, the MEC as a whole constitutes a site of existing comparative advantage, which may not require intervention to attract investment for further beneficiation of mineral products, for example. Secondly, in relation to non-MEC manufacturing activities, the MEC represents a distortion. The MEC has become so integrated and entrenched, in terms of both economic and other linkages and institutional power, that it will naturally crowd-out the development of any other industrial sector unless there is an intervention to prevent this through creating dynamic comparative advantages in non-MEC sectors. Thus, future industrial policy requires at least three components, one directed towards the MEC, a second towards the non-MEC manufacturing industries and a third thrust towards strengthening and coordinating the linkages between the two.

1. MINING AND MANUFACTURING IN THE SOUTH AFRICAN ECONOMY

South African statistics normally divide mining into four sub-sectors; gold, coal, diamonds and other mining.

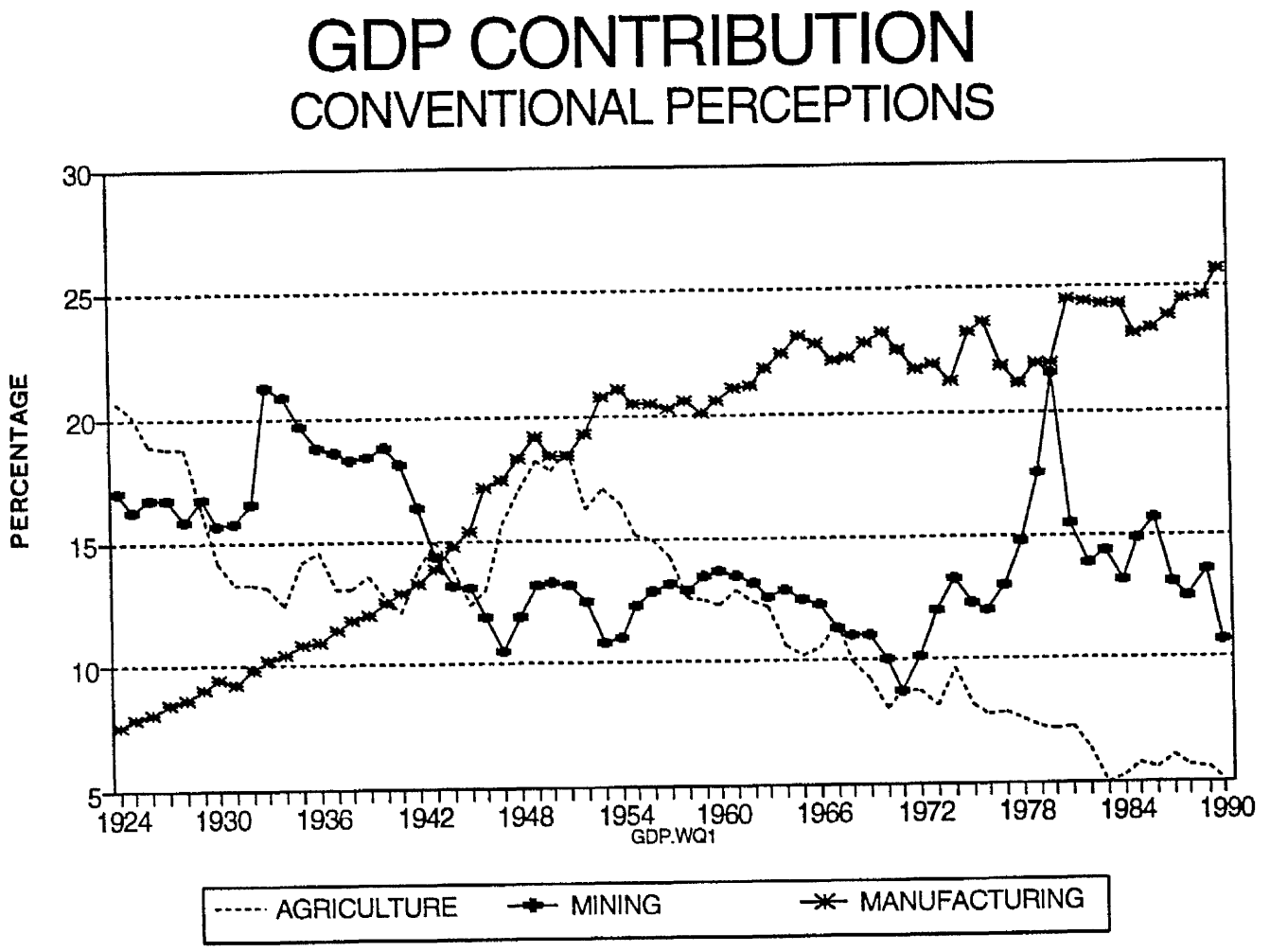
Manufacturing covers a range of value adding activities which are listed in Appendix 1. The traditional view considers mining activities as separate from manufacturing, some outputs of mining feeding into manufacturing, with manufacturing supplying some of mining's requirements for consumable items such as explosives, drill steels, chemicals, timber roof supports, as well as certain capital goods like earthmoving equipment, mine winders and continuous mining equipment.

The mining industry is widely perceived by policymakers, by the business sector and by the labour movement to be an industry in decline relative to the manufacturing sector. Mining's role is, nevertheless, recognised as being important, particularly as a major generator of foreign exchange and as an employer of labour. As will be shown, particular analyses and policy options flow from the way in which statistics are compiled on the division between "mining" and "manufacturing". Such analyses will be shown in section three to be different from analyses based on recognition of the MEC.

1.1 THE DECLINE OF MINING

Mining's relative decline is evident in its sectoral contribution to GDP, currently 12%. This has fluctuated between a low of 8% in 1971 and its peak of 22% in 1980, (figure 1.1). This is equivalent to about half the contribution of manufacturing and is roughly equal to that of the financial sector and the trade and catering sector, (table 1.1). Since 1950, manufacturing's contribution has risen relative to mining.

FIGURE 1.1 - GDP CONTRIBUTION, CONVENTIONAL PERCEPTIONS, 1924-1990



Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

TABLE 1.1 - 1989 GDP STATISTICS

	Rand (million)	% (1)GDP
AGRICULTURE, FORESTRY, FISHING	11,629	5.6
MINING AND QUARRYING	24,936	12.0
MANUFACTURING	50,896	24.6
ELECTRICITY, GAS, WATER	8,923	4.3
CONSTRUCTION	6,503	3.1
TRADE, CATERING, ACCOMM.SERVICES	27,436	13.3
TRANSPORT, COMMUNICATION	17,145	8.3
FINANCE, REAL ESTATE, BUSINESS SERV.	28,615	13.8
COMMUNITY, SOCIAL, PERSONAL SERV.	3,539	1.7
less IMPUTED FINANCIAL SERVICES	(5,883)	(2.8)
GENERAL GOVERNMENT	28,285	13.7
OTHER PRODUCERS	4,924	2.4
TOTAL	206,948	100.0

Source: South African Statistics (1990).

(1) GDP at factor incomes at current price.

The heavy dependence on the export of gold and other minerals, mostly in raw form, is seen as a weakness at the macroeconomic level which must be overcome by exporting more beneficiated products and by developing the manufacturing sector further along an export-oriented trajectory. Statistics abound to support such policy choices.

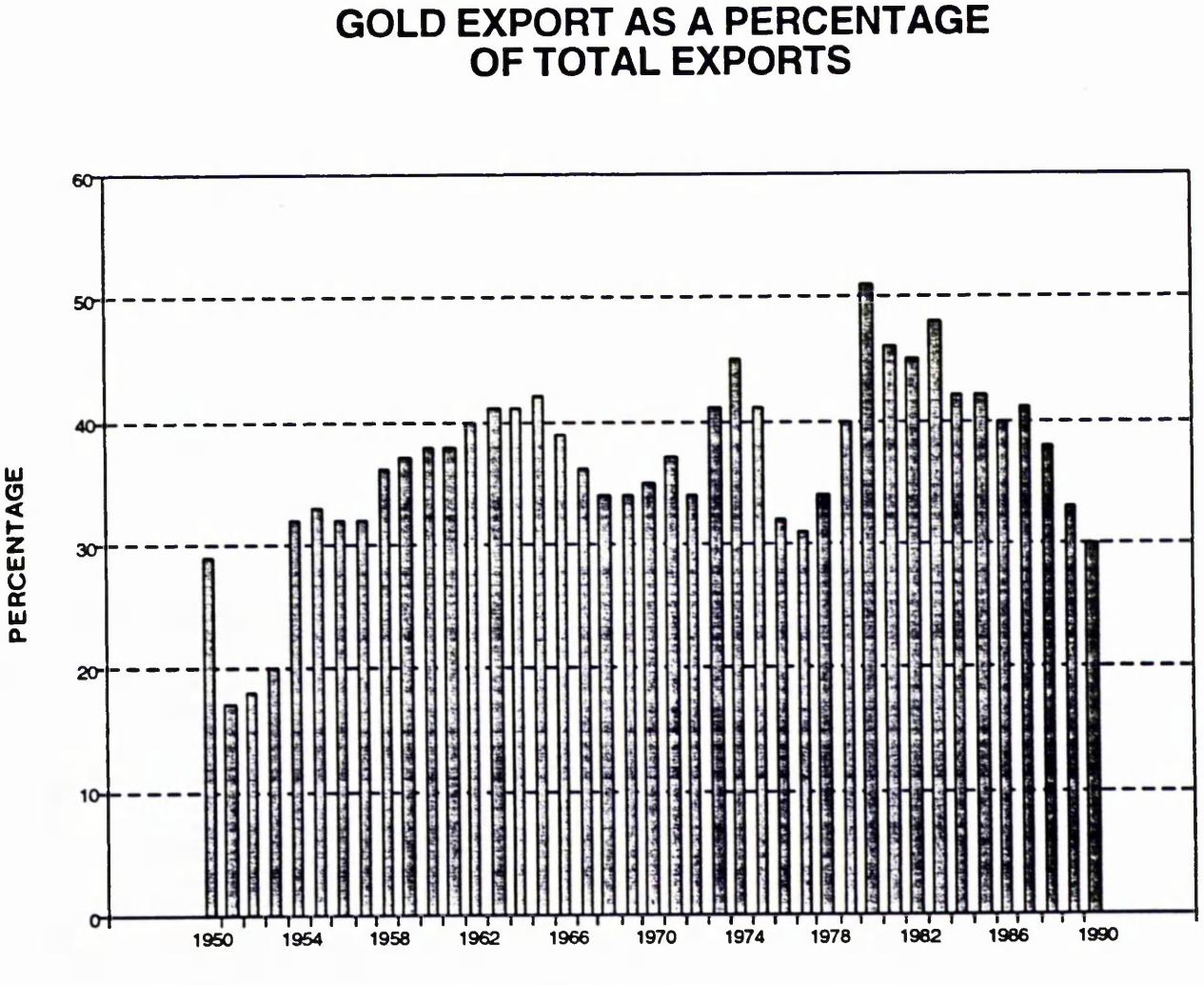
Although its price has recently declined, gold has consistently contributed more than 30% of all exports since the early 1950s. Between 1979 and 1982 when its price soared, gold exports were in the region of 45%-50% of total exports, (figure 1.2). The major corporations involved in minerals extraction and marketing are vigorously expounding the view that gold has become just another commodity, driven by supply and demand, thus contributing to the decline of the mining sector3.

3 Clem Sunter, Chairman of Anglo American Corporation's Gold and Uranium Division quoted in the Financial Mail Mining Supplement (1991)

The mining and quarrying sectors have, since 1970, consistently employed about half the number of workers in manufacturing, (table 1.4). Mining employment has fluctuated in a narrow band between 650,000 and 730,000, largely in rhythm with major gold price movements. The crisis in the mining industry in the late 1970s is reflected by a fall in gold's contribution to exports as well as a significant decline in numbers employed.4 Since 1986, there has been a steady fall in mining employment, from 763,000 to 707,000 in 1989. About 42,000, or 75%, of these jobs were shed in the gold mining industry. Further falls have taken place since 1989.

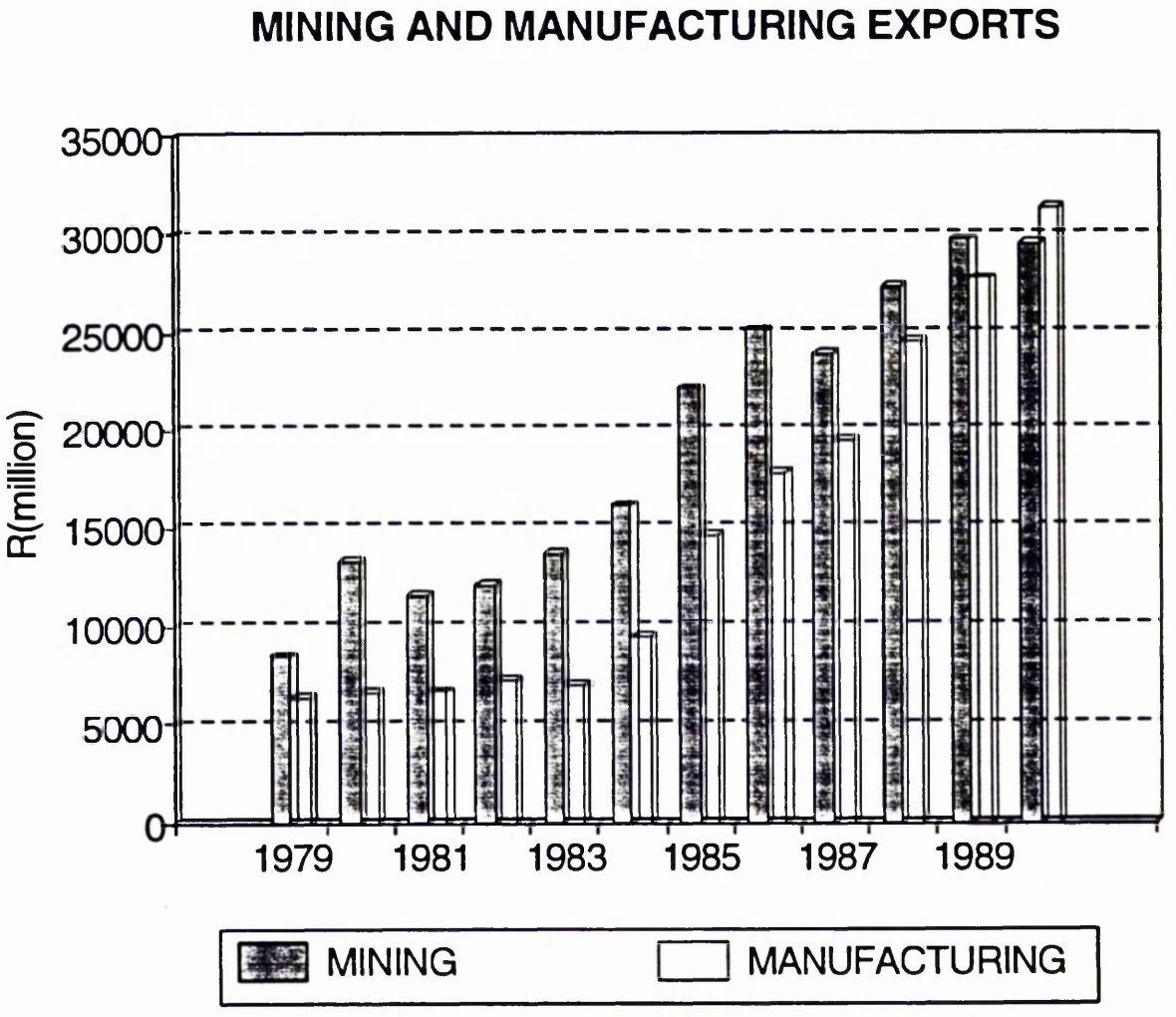
4 However both sectors have been eclipsed by a steady rise in employment in the "Social and Personal Services" sectors and "Financial, Real Estate and Business Services".

FIGURE 1.2 - GOLD EXPORTS AS % OF TOTAL EXPORTS



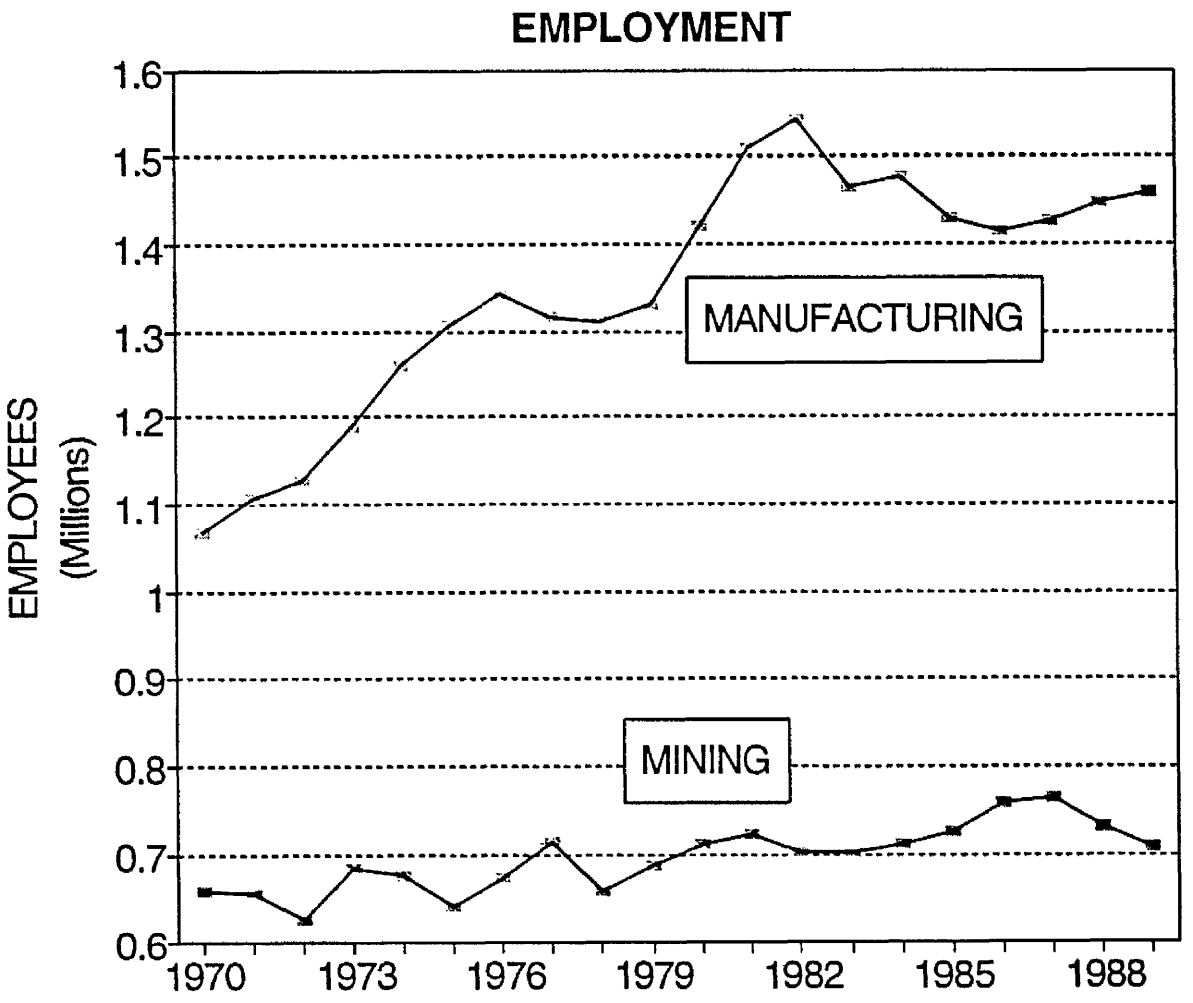
Source: South African Statistics (various years).

FIGURE 1.3 - MINING AND MANUFACTURING SECTOR EXPORTS



Source: South African Statistics (various years).

FIGURE 1.4 - EMPLOYMENT IN MINING AND MANUFACTURING



Source: South African Labour Statistics (1990).

1.2 THE RISE OF MANUFACTURING

Manufacturing, on the other hand, is regarded as the sector on which to focus future prospects. Compared to mining, manufacturing's share of GDP has risen more consistently in the post-war period, (figure 1.1). Manufacturing sector employment has grown in the 1970s to more than double that of mining, (figure 1.1), and manufacturing exports have risen faster than mining exports in the 1980s, dovetailing with other historical experiences of growth and development. (figure 1.3)

The arguments for policies supporting export-oriented manufacturing are rooted in such statistics. Sacob (1990, pp.45-6), for example, compare South African manufactured exports as a percentage of GDP with similar statistics for developed and developing countries, concluding that South Africa's ratio is among the lowest:

> South Africa is becoming a consistently smaller player in international trade. This is a combination of the effect of sanctions and the lack of an industrial environment which encourages investment and growth in those industries where the world's markets are growing the most, namely manufactured products.

Such policy thrusts, which regard manufacturing as relatively independent from other sectors, are supported by official input-output statistics, (figure 1.5). These indicate that 7.5% of manufacturing inputs (or R8.1b) are sourced from the mining sector. The mining sector, on the other hand seems more dependent on manufacturing which contributed 50% (or R5.5b) of mining inputs. A high proportion of manufacturing outputs are intermediate ones (of R153.0b produced, R62.5b was intermediate), being fed into other manufacturing sub-sectors. This partly justifies the focusing of policy on manufacturing. The need to orient manufacture to exports is underlined by

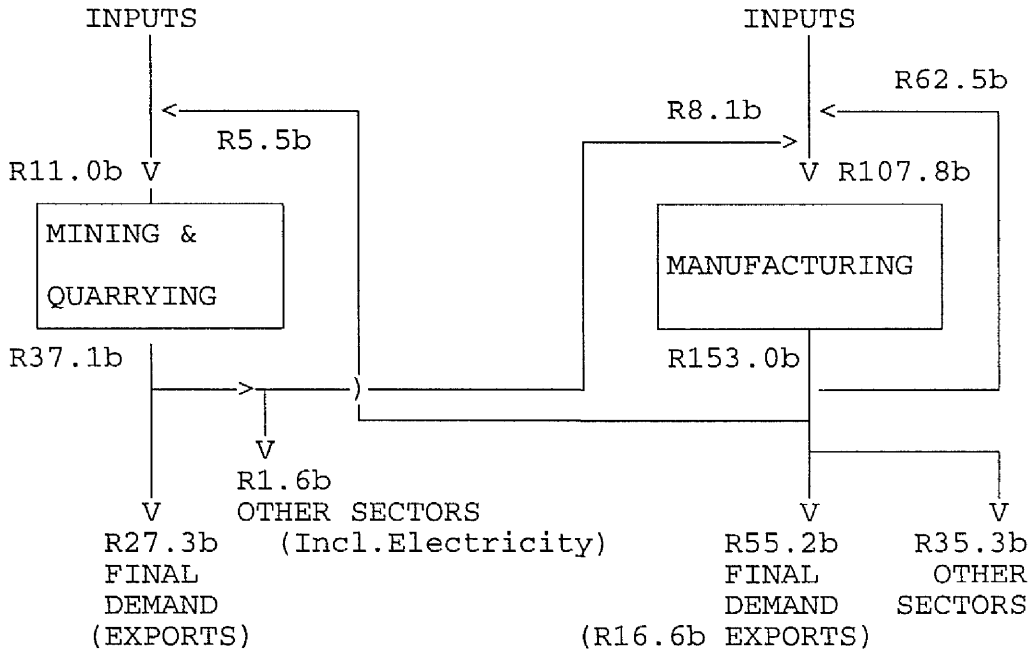
the small proportion of manufacturing exports, 10.8% of total manufacturing output (R16.6b), (figure 1.5), compared to mining exports of 73.6% of total output.5

Manufacturing's importance is illustrated by its scale of activities, dwarfing those of the mining industry. In 1988, the mining industry produced ore to the value of R37.1b, using inputs of R11.0b, (figure 1.5). Manufacturing produced goods to the value of R153.0b, using material inputs worth R107.8b. An indication of sectoral contribution to GDP is the value added (ie the difference between output value and input value). The value added in mining, some 237% of inputs, was far larger than manufacturing's 41.9% of inputs. Nevertheless, the total GDP contribution of manufacturing was about twice that of mining.

South Africa's development trajectory appears then to be one where mining output provides foreign exchange to pay for imported manufacturing inputs, with the manufacturing sector constituting the engine of growth. In absolute terms, imported mining inputs are one tenth of the value of manufacturing's imported inputs, (table 1.2). At the aggregate level, economic expansions have required increased imports for manufacturing which, in turn, have affected the balance of payments, influenced monetary and fiscal policy and, finally, have acted to choke off expansion.

5 Economic activity in both the mining and manufacturing sectors are categorised according to the International Standard Industrial Classification (ISIC) standards and these statistics are used to determine sectoral contributions to GDP as well as to categorise trade statistics. South African statistics are rather difficult to decypher because much of the production and export of strategic commodities are hidden in catch-all categories like 'classified' or 'mineral products not elsewhere classified'. Approximately half of total reported trade is listed under the 'classified' category. The method used to cull statistics in this study is discussed in Appendix 2.

FIGURE 1.5 - MATERIAL FLOWS BETWEEN THE MINING & MANUFACTURING SECTORS



Source: Input-Output Tables, (1988)

The high import propensity of manufacturing is interpreted as arising from past inward-looking policies of Import-Substituting Industrialisation (ISI). The shift to export-oriented policies in the late 1980s appears to have succeeded in raising manufacturing exports, (figure 1.3), and is used to justify the continuance of policies which reduce state intervention, are export-oriented and enhance the capability of the manufacturing sector, IDC (1990).

However, import propensities differ in terms of inputs as a proportion of outputs. Table 1.2 shows mining's propensity in terms of inputs is only slightly less than that of manufacturing; 15.1% compared to 17.8%. However, imports contribute more to output in mining. The latter's import propensity as a percentage of output is 4.7% compared to 12.3% for manufacturing. This is a reflection of the greater proportion of value added in mining. Import propensities also differ according to the diverse activities carried out in each mining and manufacturing sub-sector which involve different levels of technology, different processes and linkages and, in particular, activities which use specific inputs that are or are not available locally. This highlights the need for disaggregation of industrial sectors, particularly when conducting policy studies. Within mining, the coal sub-sector has the largest propensity to import, 20.5% of inputs compared to the mining sector's average of 15.1%. Coal mining, both underground and open cast, is highly mechanised, requiring a large quantity of imported equipment, (see table 6.6, page 351).

In section three, the conventional view of South Africa's economic development as one of declining mining and increasing manufacturing activities will be shown to be misleading, since it is based on a highly aggregated and static view of manufacturing. Apart from their

aggregate impact on economic development, ISI policies will be shown to be focused on very specific sectors and directed at strengthening and concentrating specific fractions of capital.

TABLE 1.2 - MINING, MANUFACTURING AND MEC INDUSTRIES - IMPORT INTENSITY (Rm)

	IMPORTED INPUTS	TOTAL INPUTS	IMP. %	TOTAL OUTPUT	IMP. %
MEC MINING					
COAL	260	1271	20.5	3188	8.1
GOLD	398	2924	13.6	11712	3.4
DIAMONDS	27	295	9.2	707	3.8
OTHER MINING	269	1831	14.7	4888	5.5
AVERAGE MINING	954	6321	15.1	20495	4.7
TOTAL MANUFACT.(INC.MEC)	10054	56507	17.8	81772	12.3
MEC MANUFACTURING					
FERTILISERS AND PESTIC.	193	690	27.9	1074	17.9
SYNTH. RESINS,PLASTICS	235	1162	20.2	1423	16.5
OTHER CHEMICAL PRODS.	116	639	18.1	944	12.3
OTHER BASIC CHEMICALS	2061	6699	30.8	10380	19.8
OTHER PLASTIC PRODS.	140	1029	13.6	1602	8.7
BRICKS,TILES,REFRACT.	68	370	18.3	699	9.7
CEMENT	41	238	17.2	523	7.8
OTHER NON-METALLIC MINS.	129	654	19.7	1090	11.8
IRON AND STEEL	539	3774	14.3	6110	8.8
NON-FERROUS METALS	336	1581	21.2	2387	14.1
ELECTRICITY	123	2929	4.2	6654	1.8
	3981	19765	20.1	32886	12.1
OTHER MANUFACT.(EXC.MEC)	6073	36742	16.5	48886	12.4
TOTAL MEC SECTORS	4935	26086	18.9	53381	9.2

Source: Input-Output Tables, (1984)

2. THE MEC AND MANUFACTURING IN THE SOUTH AFRICAN ECONOMY

2.1 DEFINING THE MINERALS-ENERGY COMPLEX

Although section one shows that, in aggregate terms, mining only provides 7.5% of manufacturing inputs, these inputs are essential to several key sectors of manufacturing which, in turn, support many other productive activities. At the beginning of 1990, 1100 mines and quarries were in operation, producing 80 different minerals. South African Statistics (1990, p.11.16) define the "mining" sectors as;

> ... any activities in connection with underground and surface mining, including stone quarries, clay and sand pits, wells (except for water) and salt pans and all supplemental activities for the dressing and beneficiation of ores and other crude materials, such as crushing, screening, grading, milling, flotation, melting, pelleting, topping and other preparations needed to render the material marketable.

Many productive "mining" activities are integrally linked, often physically integrated, with productive activities within the "manufacturing" sector. The separation of value added in each usually takes place at the level of national and corporate accounting procedures.

Few mineral-producing countries today export unbeneficiated primary mineral commodities. Many developing countries in recent years have tended to process their minerals partially, mainly through smelting, to produce a concentrate of higher value which is then either refined or, more often, shipped to refineries in more developed economies. Jourdan's (1990) study of minerals production in the Southern African region shows that this tendency is fairly advanced. About

98% of Zambia's copper production (6% of world supply in 1988) is exported in the form of pure refined copper cathodes; Cobalt (14% of world supply in 1988) is produced as a by-product of copper smelting; 50% of the region's nickel output is exported as a beneficiated sulphide matte; almost all chromite ore mined in Zimbabwe is smelted and exported as ferrochrome (7% of world supply in 1988). There are exceptions to this tendency, for example Zaire which exports copper blister - a less refined form of copper - to Belgium for refining even though excess capacity exists in neighbouring Zambian smelters.

Although the smelting and refining of mineral ore is usually integrated with mining operations, with smelters and refineries sited on or close to the mine, the value added is often abitrarily divided between mining and manufacturing statistics. Consider chrome. The mining of chrome ore underpins the manufacturing activity of smelting the ore, yet the mining activity contributes about one third less value than the processing of ore. In 1987, the mining of chrome ore contributed about 0.16% to South African GDP, with sales of R242.4m. Smelting the ore produced ferrochrome worth R730.6m and this contributed about 0.48% to GDP.[6] Smelting is statistically located in the "Non ferrous metal basic industry" sub-sector of the "manufacturing" sector even though there is an almost continuous process involved from mining to ferrochrome production.

The concentrated levels of ownership that characterise the South African economy also have an impact on the allocation of value added. Genmin, for example, owns a number of mines through their Cromore (Pty) Ltd holding company. Ore is transported to the nearby smelters of Genmin-owned Tubatse Ferrochrome (Pty)

6 Source: Census on Mining (1987, pp.33, 82-83). GDP data from South African Statistics, (1990, pp.21.9).

Ltd. The smelting process is operated by a different company within the same conglomerate group for a number of reasons, including the objective of minimising tax and maximising use of specific state policies (such as manufacturing incentives promoting beneficiation and exports. A critical factor in this division is the price at which the raw material is transferred from the "mining" activity to the "manufacturing" activity. Often this price is simply an accounting variable which is optimised in the process of maximising group profits. However, the effect of this often exacerbates the artificial difference between "mining" and "manufacturing" activities. If the transfer price were minimised, due to attractive tax incentives and write-offs in beneficiation, the effect would be to reduce the GDP contribution of mining and correspondingly raise, artificially, the GDP contribution of the manufacturing activity (even if it were accepted that they were separate).

The construction and casual interpretation of economic statistics categorised by "mining" or "manufacturing" and the abitrary allocation of value added to each, does not adequately and accurately represent the strengths and weaknesses of South Africa's resource based economy and can, therefore, be misleading. It is, correspondingly, more useful to recognise inherent and logical productive linkages and to conceptualise them integrally. In this vein, a Minerals-Energy Complex (MEC) which includes, at least, the following economic sectors can be identified.7

- Coal, gold, diamond and other mining activities.
- Electricity.
- Non-metallic mineral products.8

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7 These are largely related to productive activities downstream of mining. The capital goods and mining supply industries that produce inputs for mining are not dealt with empirically in this chapter. However, it is clear that their inclusion will serve to extend the scope of the MEC.

8 Includes mica, phosphate concentrate, bricks, tiles, refractories, cement.

- Iron and steel basic industries.
- Non-ferrous metals basic industries.9
- Fertilisers, pesticides, synthetic resins, plastics, other chemicals, basic chemicals and petroleum.

The rationale for including these primary and secondary mineral processing activities, together with electricity, within the boundaries of the MEC is developed further below.

While existing statistics categorise "electricity" as an economic activity separate from "mining and quarrying" and "manufacturing", there are extensive linkages between these.10 More than 90% of electricity is generated from coal, a "mining" activity, the balance sourced from hydro-electric and nuclear stations (the latter also ultimately sources its feed from uranium mining and electricity-intensive, coal-powered enrichment). Some 21.6% of electricity output is consumed in the coal, gold, diamond and other mining sectors. An additional 21.3% of electricity output is consumed in the energy-intensive smelting and refining processes in just three sub-sectors of manufacturing - namely, Other Non-metallic Mineral Products, Iron and Steel Basic Industries and Non-ferrous Metal Basic Industries.11

While chemicals and petroleum production activities may seem remote from mining, they are linked largely through the coal mining industry, on which the South African economy is heavily reliant. Firstly, the production of fertilisers, plastics, chemicals and petroleum depend on energy-intensive processes which consume large quantities of electricity, in turn, generated from coal. The Sasol II and III plants at Secunda in the eastern Transvaal utilise a large

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9 Includes platinum group metals, silver and ferrochrome.

10 Strictly speaking, this category is defined as "Electricity, Gas and Steam" although the value of gas and steam generated is low. See South African Statistics, (1990).

11 Based on Input-Output Tables (1988) after excluding losses in generation and transmission.

proportion of the output of the nearby 3600MW Kriel power station (built specifically for that purpose).12 Of the 175.6 million tons of coal mined in South Africa in 1989, 46.8mt was exported. From remaining local sales of 128.8mt, 70.0mt was used by Escom to produce electricity, 35.0mt was consumed by the three Sasol plants to produce synthetic fuels and chemicals, and 1.1mt was used by AECI to produce ammonia, explosives and methanol at Modderfontein. AECI also produces some chemicals at Umbogintwini from coal feedstock. The AECI/Sentrachem Coalplex plant at Sasolburg produces PVC from coal and, until it was mothballed recently, Sentrachem was producing synthetic rubber from coal at its Karbochem plant at Newcastle. A coal-based industrial gas grid supplies industries in the PWV area from the Sasol plant in Sasolburg.

Non-metallic mineral products such as cement and bricks, the inputs to building and construction industries, are immediate downstream activities from mining. In both cases, mined or quarried products, such as limestone and gypsum, are crushed mixed and heated, often using coal as the fuel. These plants are usually located close to the quarries which supply their raw materials.

Iron and Steel industries are not as numerous as cement and brick-making plants. They are, firstly, more capital-intensive and, secondly, have been regarded by almost every government in the world as a strategic economic sector. Even today, when state intervention is no longer fashionable and under ideological attack, many of the steel industries in Europe are protected either directly or indirectly. Of the three steel producers in South Africa, the recently privatised Iscor dominates the industry. Iron ore, coal and electricity constitute the

12 500MW is generated internally and 400MW is bought in. The greatest demand is from the air separation plants.

major inputs to steel manufacture which is produced in the form of shapes, sections, tubes, wire or castings. Other mineral products, such as chrome and vanadium, are also used to produce alloys and various grades of stainless steels, although at present only one plant, Middleburg Steel and Alloys, currently produces stainless steel. Some 62.8% of direct inputs to the Iron and Steel Basic Industries is sourced from within the MEC while 22% of the Iron and Steel sector's output is fed back into the MEC.

Chrome, copper, silver, aluminium, platinum and platinum group metals are the major components of the non-ferrous metals category. As with steel, the respective ores are smelted and refined to produce the basic sections, castings or refined mattes that are then either sold on commodity markets or used in subsequent manufacturing activities.

The cohesion of the MEC is illustrated by table 1.3, which shows that 58.3% of MEC inputs are from the MEC and that 27.7% of MEC output is returned to MEC sectors. In summary, it is more useful to distinguish between a non-MEC manufacturing sector and the MEC, made up of mining and quarrying, the electricity sector and a number of related sub-sectors of manufacturing.

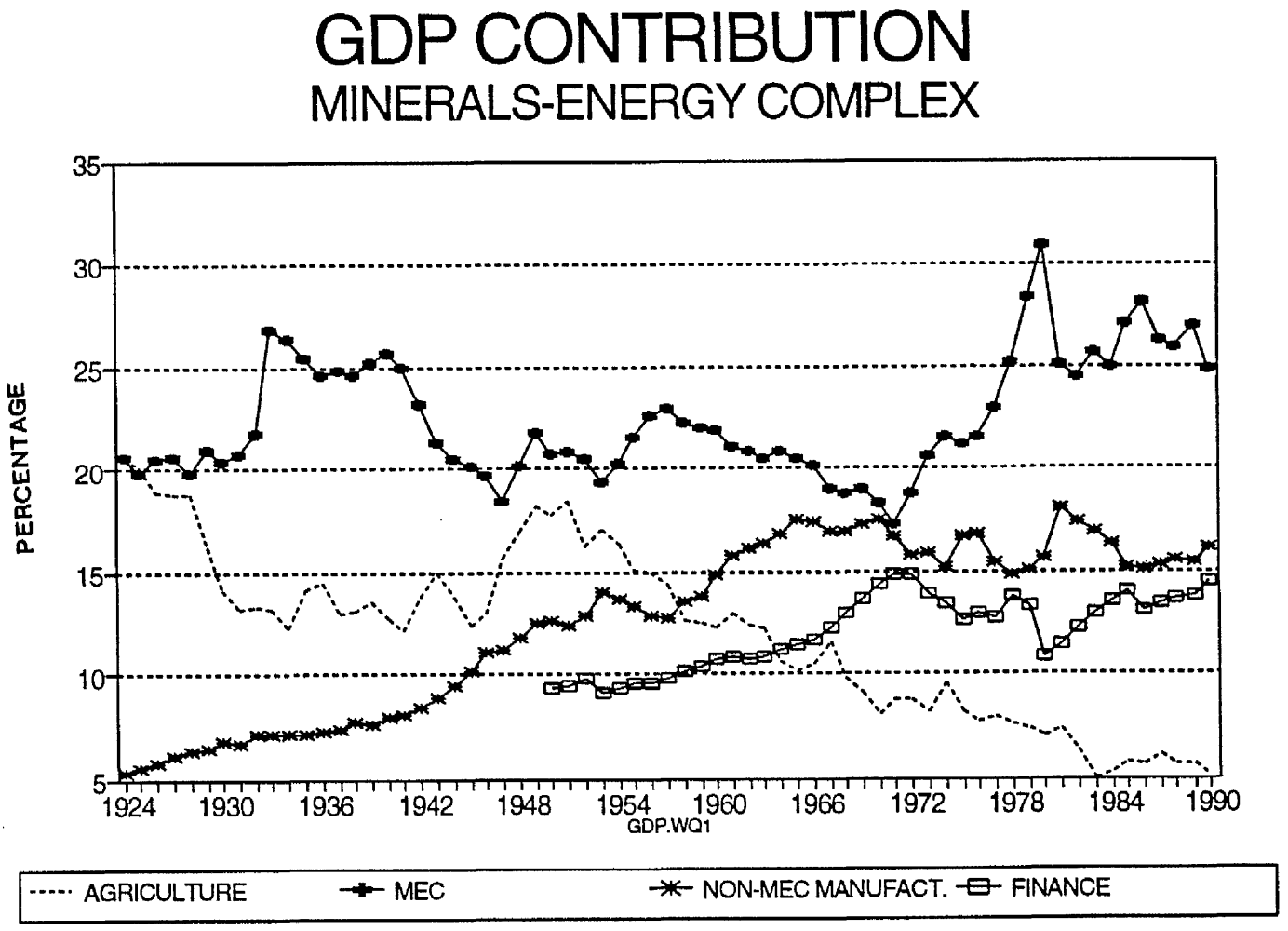
TABLE 1.3 - THE INTERDEPENDENCE OF THE MEC - INPUT/OUTPUT LINKAGES

MEC VALUE ADDED	as a % of OUTPUT	52.6%
MEC INPUTS	as a % of TOTAL INPUTS	58.3%
MEC OUTPUTS to MEC	as a % of TOTAL OUTPUTS	27.7%

MEC SUB-SECTOR	INPUTS FROM MEC	INPUTS FROM OTHER SECTORS	VALUE ADDED LABOUR PROFIT TAXES	OUTPUT TO MEC	OUTPUT TO OTHER SECTORS
COAL	653	1484	2988	1952	3172
GOLD	1843	3228	16706	0	21776
DIAMONDS	197	734	1081	0	2012
OTHER MINING	963	1920	5319	6709	1492
FERTILISERS AND PESTICIDES	755	315	267	181	1155
SYNTHETIC RESINS, PLASTICS	1964	417	697	1726	1352
OTHER CHEMICALS	692	470	525	1016	672
OTHER BASIC CHEMICALS, PETROLEUM	6477	2918	6674	4831	11237
OTHER PLASTIC PRODUCTS	1437	602	916	300	2654
BRICKS, TILES, REFRACTORIES	397	264	511	94	1079
CEMENT	212	162	497	202	669
OTHER NON-METALLIC MINERAL PRODUCTS	691	441	699	284	1547
IRON & STEEL BASIC INDUSTRIES	4899	2897	4096	1725	10167
NON-FERROUS METAL BASIC INDUSTR.	2057	1166	1879	1123	3980
ELECTRICITY	3269	1939	7279	6364	6122
TOTAL	26506	18957	50134	26507	69086

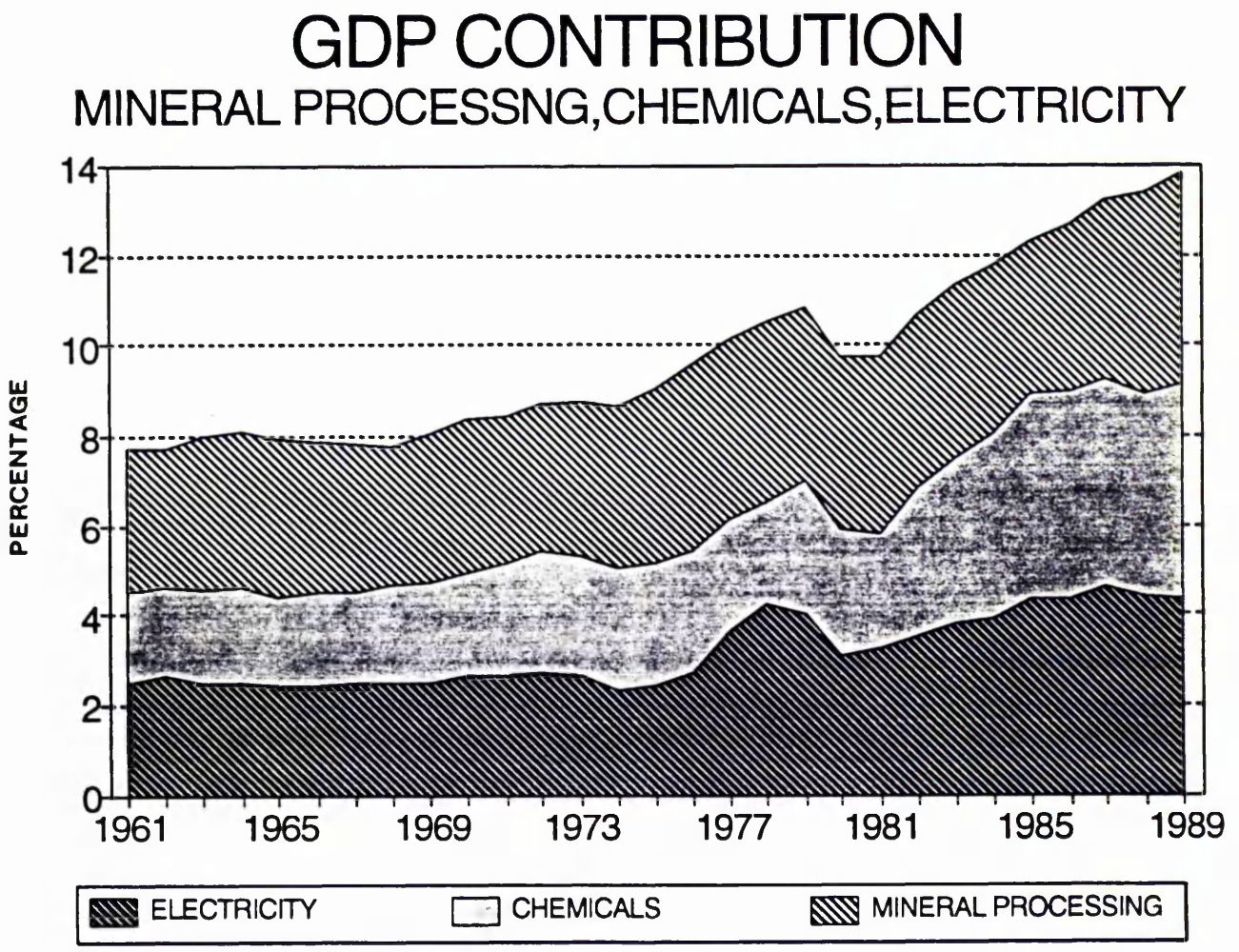
Source: Input-Output Tables, (1988)

FIGURE 1.6 - GDP CONTRIBUTION OF THE MEC, 1924-1990



Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

FIGURE 1.7 - % GDP MINERAL PROCESSING, CHEMICALS, ELECTRICITY



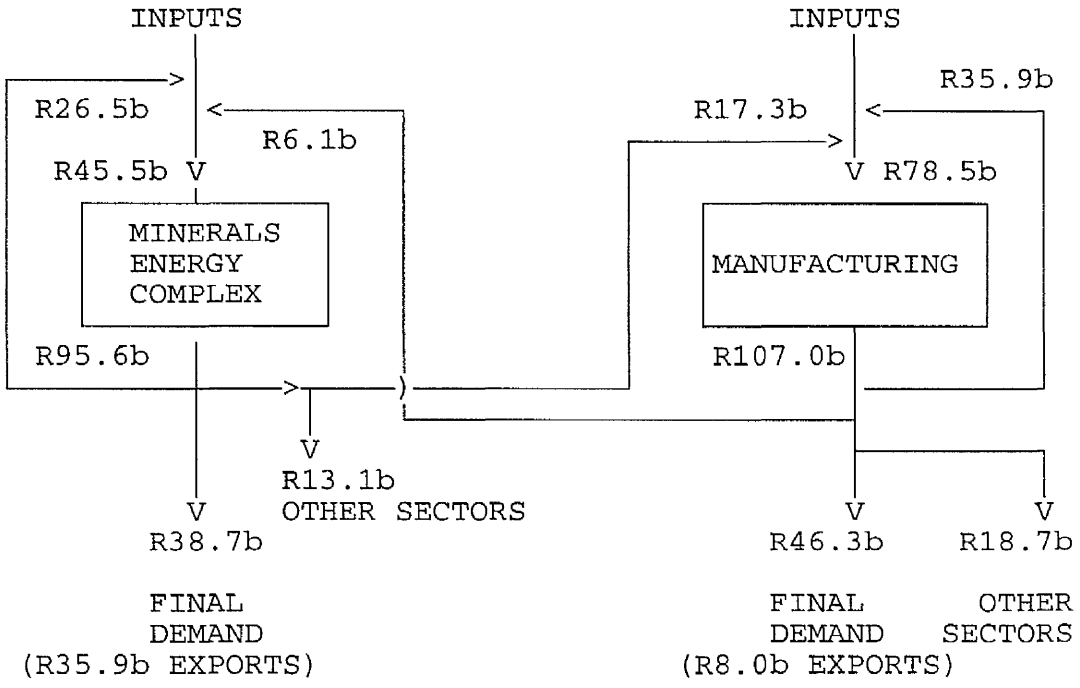
Source: South African Statistics (1990).

2.2 MODIFYING NATIONAL STATISTICS TO TAKE ACCOUNT OF THE MINERALS-ENERGY COMPLEX

The change in the distribution of GDP resulting from focusing upon the central role of the MEC is illustrated in figure 1.6. Non-MEC manufacturing has, since 1960, stagnated within a narrow band of 15-17% of GDP. The MEC's relative contribution to GDP fell in the 1960s from 22% to about 17% but rose to a high of 32% in 1980 and then settled within a band of 25-27%. The impact of the most recent decline in the gold price is partly shown by the dip in the MEC's contribution to GDP, from 27.5% in 1989 to 25% in 1990, (figure 1.6). But, unlike mining alone, the MEC is not only affected by the gold price. Escom power generation, Sasol's petroleum-chemicals complex and the rise in minerals processing have underpinned its integrated dominance of the economy. The largest growth in the MEC's GDP contribution seems to have taken place in the capital-intensive minerals processing and chemical (largely Sasol) industries in the 1980s, whereas it was the electricity industry that grew in the 1970s, (figure 1.7).

What particularly stands out is that the growth of the MEC has been accompanied by stagnation of the non-MEC manufacturing sector since 1960. The latter's contribution to GDP has not risen above 18% (1981) and has declined to 15% in 1989. Non-MEC manufacturing also exhibits weak forward and backward linkages with the MEC, (figure 1.8). Forward linkages between the MEC and non-MEC manufacturing are, however, stronger than between mining and manufacturing. Some 22.1% of non-MEC manufacturing inputs are drawn from the MEC, mainly from the iron and steel, basic chemicals and petroleum, synthetic resin and plastic and non-ferrous metal sub-sectors. However, MEC backward linkages are relatively weak, almost de-linked from manufacturing. Only 13.4% of MEC inputs were drawn from manufacturing. This contrasts with the standard analysis of mining vs. manufacturing where 50% of mining inputs are drawn from the manufacturing sector.

FIGURE 1.8 - MATERIAL FLOWS BETWEEN MEC & MANUFACTURING



Source: Input-Output Tables, (1988).

2.3 EXPORTS FROM THE MEC

The impression drawn from figure 1.3, that "manufacturing" exports are rapidly surpassing those of "mining" is rather misleading. While "mining" exports as a percentage of total exports have gradually declined during the 1980s, the economy has remained dependent on exports from the MEC. Dependence on foreign exchange from gold exports has shifted to dependence on exports of other raw minerals, processed minerals, steel and chemicals, (figure 1.9). Thus, in the same period that gold's share fell from 51% to 31% of exports, total MEC exports as a percentage of all other exports fell from 75% to only 63%, emphasising the centrality and resilience of the MEC within the South African economy. The apparent relative rise in exports of non-MEC manufactures is partly due to declining commodity prices, including that of gold.1 One third of manufacturing exports consist of processed minerals, steel and chemicals, (figure 1.9).

What is also apparent is the classic developing economy's vulnerability to fluctuating mineral commodity prices, both raw and beneficiated. Figure 1.2 illustrates cyclical movement in the value of gold exports. Non-gold raw mineral exports as a percentage of total exports have fluctuated during the 1980s, between 17% and 21%, with the exception of 1987 and 1988 when they fell to 14%, (figure 1.10). Processed minerals (mainly ferro-alloys and vanadium) have swung between 3% and 8% of total exports between 1979 and 1990, falling back to 5% in 1990 due to plummeting commodity prices, (figure 1.11). Exports of beneficiated minerals, such as steel and chemicals, both part of the MEC, rose from 5% of total exports to 9% between 1980 and 1990. This highlights the need for further research on the nature and dynamics of world minerals markets and the manner in which South

1 Commodity Export Price Indices (CEPI) have declined in real rand terms since 1983. Refer to Minerals Bureau (1988) and (1991).

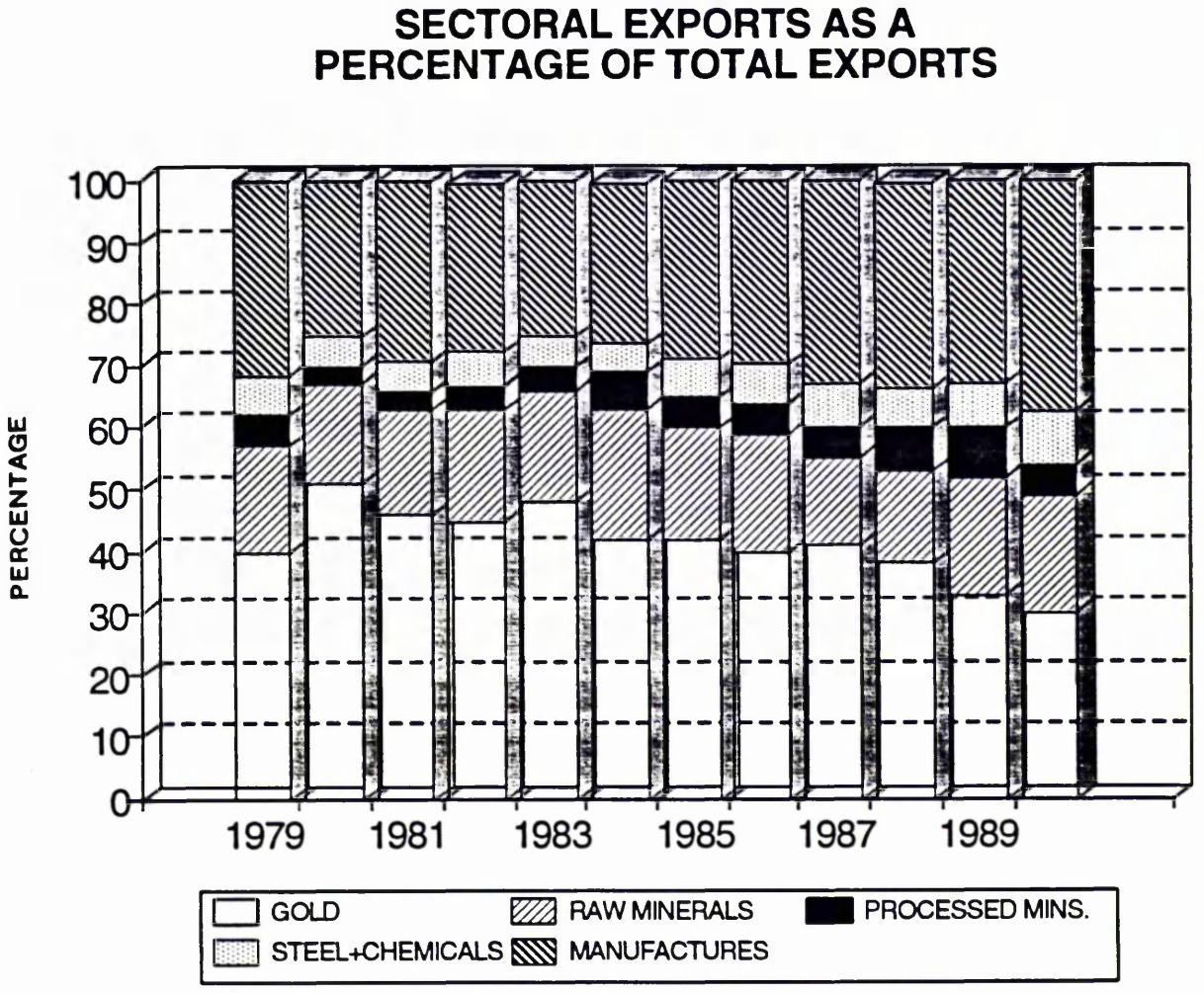
African exports locate themselves within them, for major policy implications flow from this.

2.4 IMPORT-INTENSITY

Rather than viewing the economy as one resting on a narrow export-oriented mining base, the picture here is of a more diversified core, the MEC, with greater linkages, than from mining alone to the rest of the economy. Such analysis, of course, requires deepening for it takes no account of ownership, treating mining and manufacturing sub-sectors as operating in unison with no conflict or tension. Furthermore, there is no distinction between the import of capital and consumption goods and the degree of dependence on technology through, for example, licensing. Such factors are likely to be sector-specific and require further research.

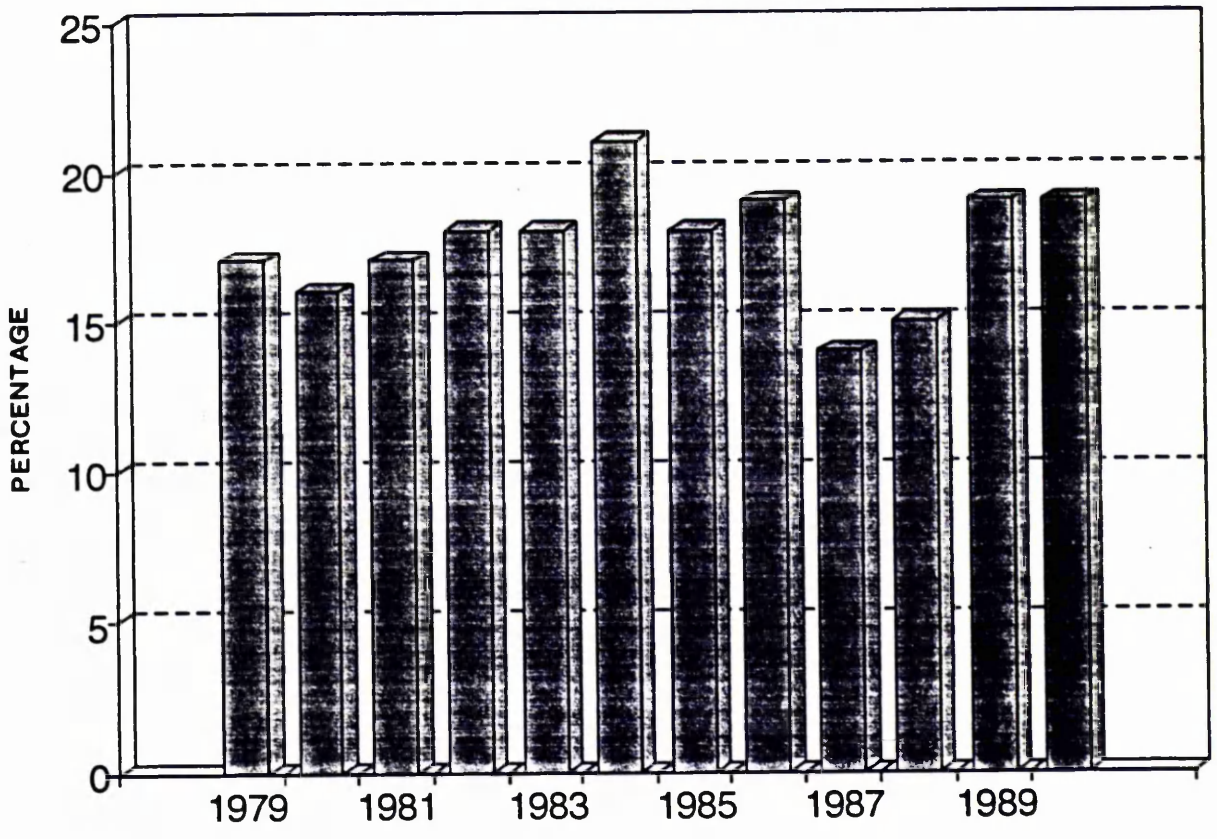
The import propensity of the MEC is higher than that of non-MEC manufacturing in terms of inputs; 18.9% versus 17.8%, and slightly lower in relation to output; 9.2% compared to 12.3%. Despite the highly capital-intensive nature of MEC sectors, and their acknowledged reliance on imported capital goods, imports of intermediate consumables are also included in aggregated statistics of import propensity. A major reason for the high import propensity of the MEC is the continuing dependence of the sub-sector "other basic chemicals" on imported crude oil. Roughly 20% of all 1984 manufacturing sector imports were related to crude oil imports. Of course, this might have reduced since 1984, the year on which these statistics were based.

FIGURE 1.9 - SECTORAL EXPORTS AS % OF TOTAL EXPORTS



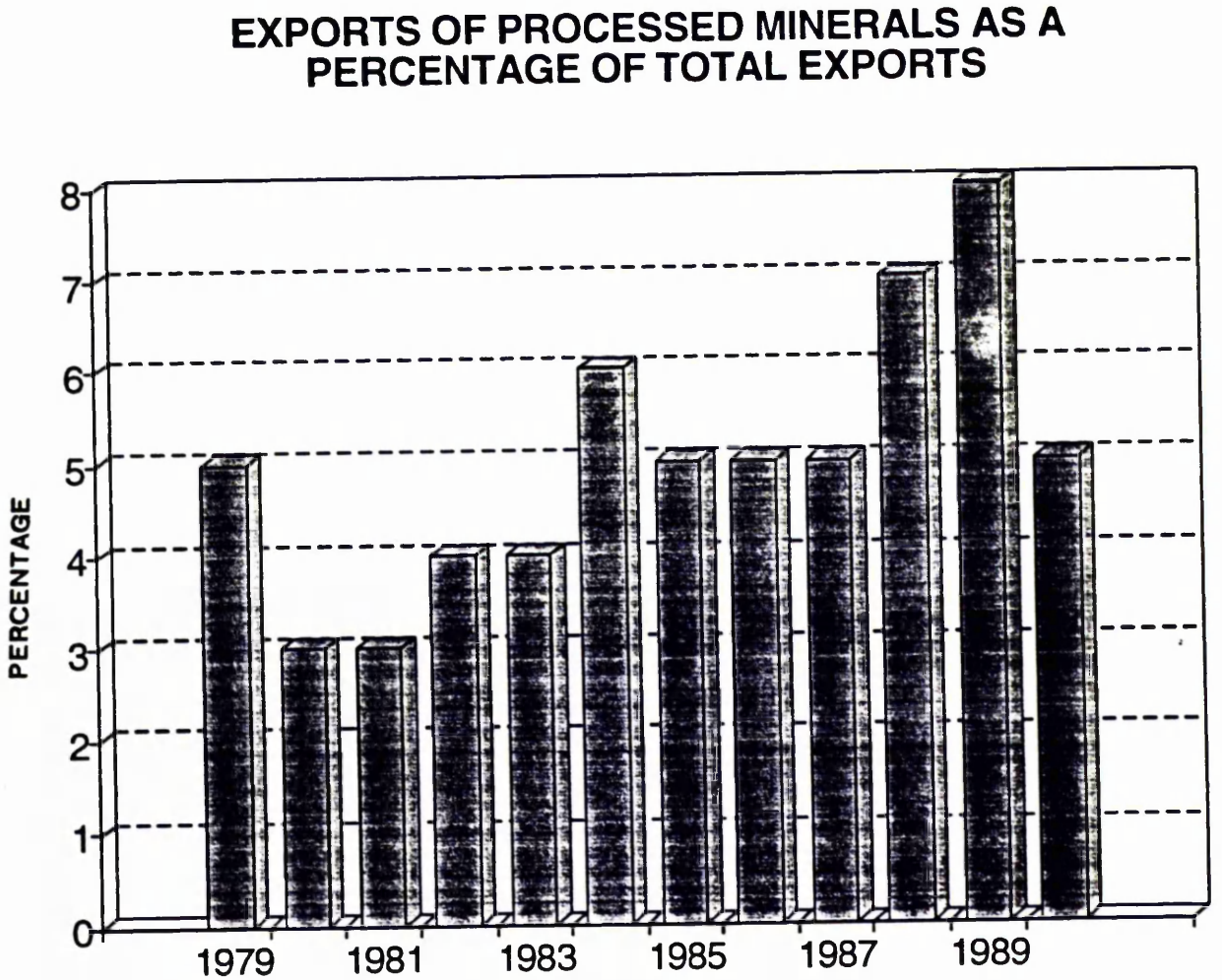
Source: South African Statistics (various years), South Africa's Mineral Industry Yearbook (various years)

FIGURE 1.10 - NON-GOLD RAW MINERAL EXPORTS, % TOTAL EXPORTS



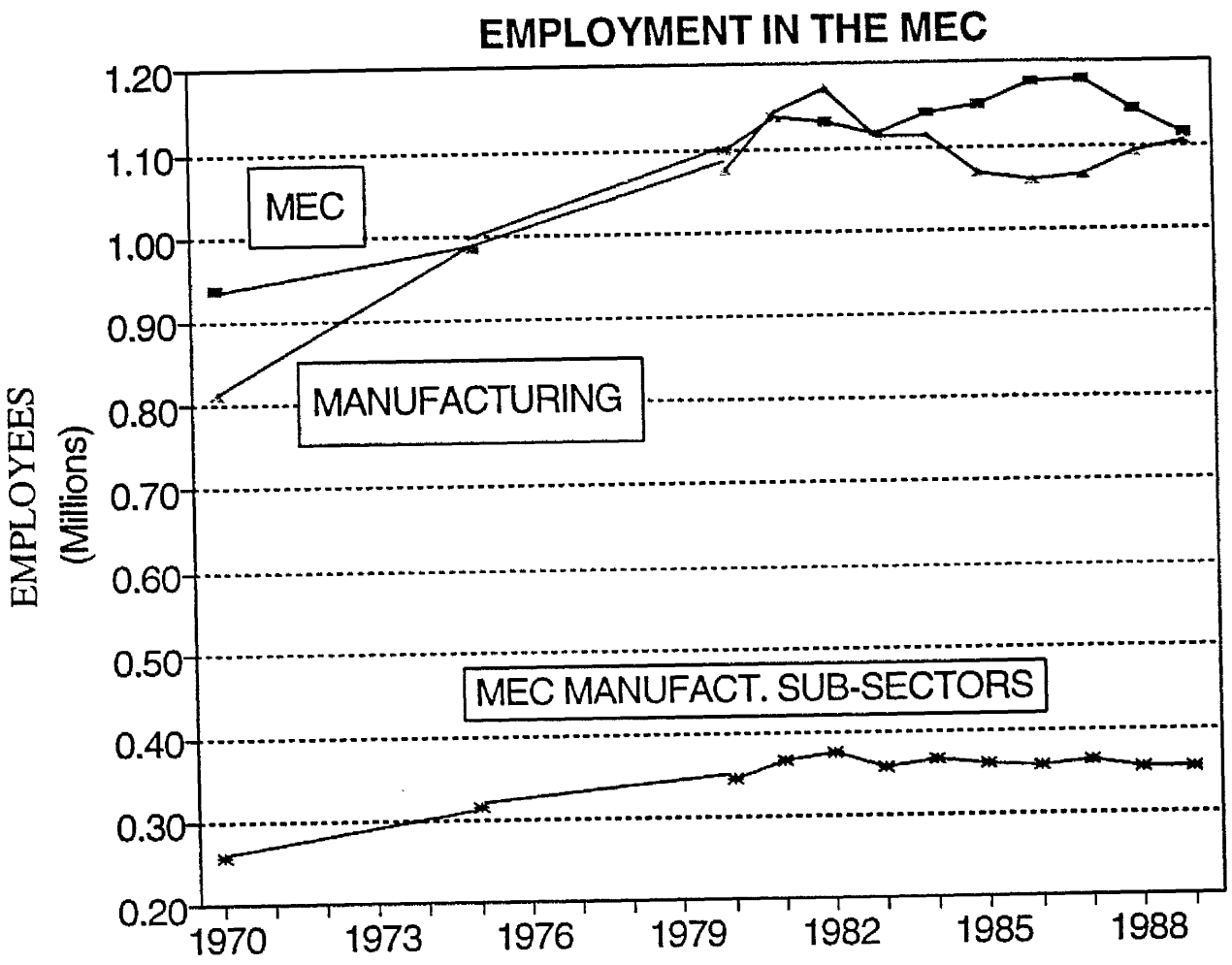
Source: South African Statistics (various years), South Africa's Mineral Industry Yearbook (various years)

FIGURE 1.11 - PROCESSED MINERAL EXPORTS AS % TOTAL EXPORTS



Source: South African Statistics (various years), South Africa's Mineral Industry Yearbook (various years)

FIGURE 1.12 - EMPLOYMENT IN THE MEC



Source: South African Labour Statistics (various years)

2.5 LABOUR

Shifting MEC activities out of manufacturing (statistically) reveals a more even pattern of employment between the MEC and manufacturing, (figure 1.12). Employment in manufacturing (excluding MEC) grew from 0.81 million in 1970 to a peak of 1.12 million in 1982, falling to about 1.06m in 1986 but subsequently rising again. MEC employment has been falling since 1986, largely due to the declining gold mining industry. Sub-sectors of manufacturing that fall within the MEC have employed a fairly static number of workers in the 1980s, about 350,000. This partly reflects the capital-intensity of MEC manufacturing sectors. The downturn in the gold mining industry has had a severe impact on many other sectors of the economy. Frost (1990) shows that it also led to attempts to increase the mechanisation of gold mining, although with limited success. The mechanisation of mining has been a continuous process, driven by material factors such as ore grades and depths, as well as by the exploitative relationships between labour and capital. Mechanisation has been increasingly energy-intensive, particularly on electricity.

The liberal-modernist view of capitalism's progressive impact on apartheid is particularly undermined by the existence of the MEC.[2] Apartheid, and in particular the system of supplying of cheap labour, is said to have favoured mining but not some of the more sophisticated capital-intensive continuous manufacturing processes. This suggests a tension between these manufacturing interests and those of mining. However, the evidence of increasing mechanisation in mining sectors such as coal, platinum and diamonds imply that the above dichotomy between mining and manufacturing is not so stark. It would appear that mechanisation possibilities are lower in the case of gold mining largely due to technical factors. Nevertheless, huge quantities of

[2] See, for example, Lipton (1986)

capital have been expended by gold mining houses through the Chamber of Mines Research Organisation (COMRO) in searching for ways to raise productivity in gold mining.[3] Contrary to assertions that the manufacturing sector is the greatest creator of wealth, value added is actually higher in the mining sector, (table 1.4); on average R35,282/employee compared to manufacturing's R31,236/employee in 1988.[4] This is likely to rise with increasing mining mechanisation. Low wages are not relevant here since value added is defined as wages, taxes and profits. Mining is clearly as important a site of national accumulation as manufacturing. Moreover, as has been demonstrated above, mining is the starting point for much downstream MEC and other economic activity.

TABLE 1.4 - VALUE ADDED IN MINING AND MANUFACTURING

	WAGES	GROSS PROFITS	INDIRECT TAXES	EMPLOYEES (1)	VALUE ADDED PER EMPLOYEE
COAL	1209	1709	69	93767	31855
GOLD	7005	9554	146	531640	31422
DIAMONDS	356	689	36	14497	74567
OTHER MINING	1679	3421	219	99619	53393
TOTAL MINING	10249	15373	470	739523	35282
MANUFACTURING	23771	20476	998	1448500	31236

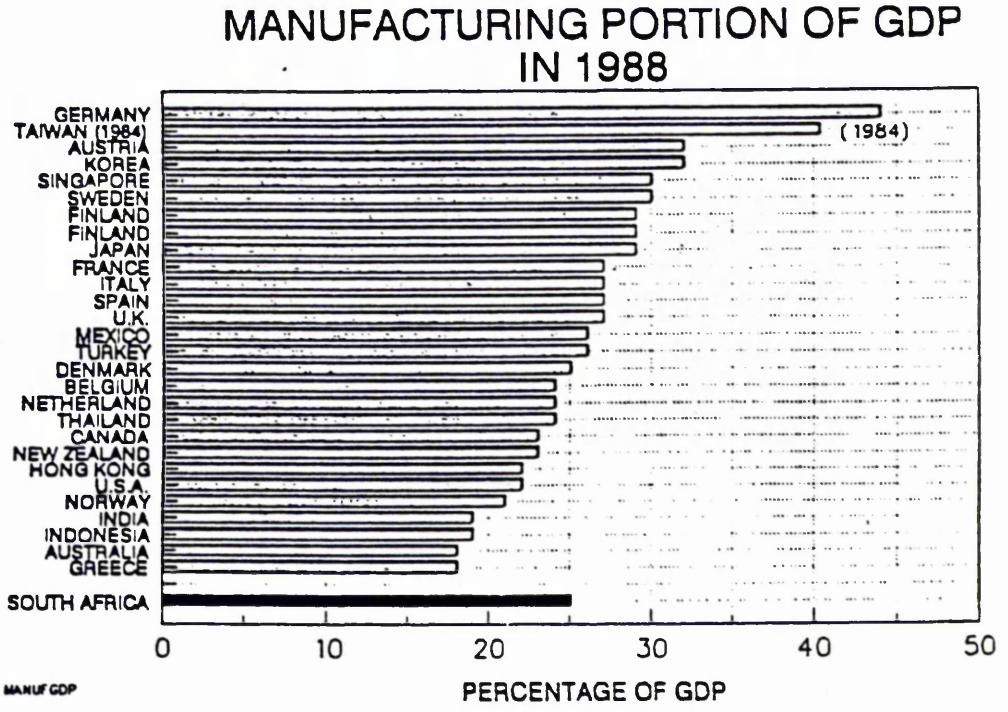
Source: Input-Output Tables, (1988).

(1) 1987 figures, South African Statistics (1990).

[3] Interestingly, Edwards (1991) has shown that Research and Development(R&D) spending in the mining and mineral processing industries is highest when commodity prices are high, falling with the fall in prices. Thus, there has recently been a drastic curtailment in Research and Development spending by the Chamber of Mines.

[4] Based on Input-Output Tables (1988):
Mining (R37.1b-R11b)/732522
Manufacturing (R153b-R107.8b)/1448500

FIGURE 1.13 - INTERNATIONAL MANUFACTURING AS A % OF GDP, 1988



Source: Sacob (1991).

SUMMARY

While it is useful to conceptualise mining activities as separate from manufacturing, this practice has masked a more fundamental and structural interlinkage between mining, energy generation and the manufacturing sector. At the core of the South African economy lies a Minerals-Energy Complex, exhibiting the following characteristics:

- A contribution to GDP that is significantly larger than that of non-MEC manufacturing and one that is consistently growing.

- A stagnating non-MEC manufacturing sector.

- The falling export contribution of gold, has been partly offset, firstly, by growing exports of other raw and beneficiated minerals, particularly exports of coal-based chemicals. These, together with a large but unquantified saving in imports of crude oil and certain chemicals, have contributed to making the foreign exchange balance of the MEC increasingly positive since the early 1980s.

- Exports of raw and beneficiated MEC commodities are subject to cyclical international markets and declining terms of trade.

- An increasing capital-intensity, particularly in the MEC sectors.

- Forward linkages between the MEC and the rest of industry are stronger than between mining and manufacturing. The non-MEC manufacturing sector already relies heavily on inputs from the MEC. Beneficiation is unlikely to change this and will only strengthen the role of the MEC.

- Weaker backward linkages are not uniform across the entire MEC. In particular, there is a heavy reliance of mining on inputs from the non-MEC manufacturing sectors, particularly the engineering industries, chapter 6.

The traditional narrow export-oriented mining base of a developing economy has thus been transformed into a more diversified Minerals-Energy Complex although there has not been a corresponding strengthening of linkages between the MEC and the rest of manufacturing.

3. THE MEC AND MANUFACTURING-LED INDUSTRIALISATION

The MEC is not simply a descriptive or analytical category as described in Section two. It has also been the target of post-war development policies and a core site of capital accumulation. The characterisation of these policies as Import-Substituting-Industrialisation conceals more than it reveals. State policies have facilitated the concentration and centralisation of scarce capital resources in projects which have mainly fallen within the MEC. The MEC is, therefore, a testament to the success of this process which has reaped the benefits of economies of scale and scope, even if the benefits were unevenly distributed towards specific fractions of capital. The relatively stunted non-MEC manufacturing sector is the negative counterpart to this process.

Interventions by the Industrial Development Corporation (IDC) have contributed significantly to the growth of the MEC. The IDC historically chose to finance the establishment of infant industries which largely fell within the non-mining sectors of the MEC, including phosphates (1952), Palaborwa copper (1963), coal based chemicals; Sasol I (1951), synthetic rubber (1962), Soekor oil exploration (1965), Alusaf aluminium smelter

(1967), industrial chemicals (1967), Sasol II (1976), Sasol III (1979) and Mossgas (1986).

While the IDC promoted other industries, including military industries such as Atlas Aircraft Corporation (1964), most resources have been deployed to promote the MEC, (table 1.5); 68.3% in 1960, falling gradually to 37.4% in 1980 and rising to 48.0% in 1985.5 The upward trend since 1980 is set to continue. The IDC has indicated that its next targets include steel and stainless steel beneficiation, wood pulp, chemicals and petrochemical products.6 Simultaneously, the IDC (1990) is justifying the non-targeting of other industrial sectors on the basis that they already receive excessive protection. Past industrial policy which mainly involved erecting tariff barriers is simply being put in reverse, without the addition of other policy tools.

TABLE 1.5 - IDC FINANCING OF THE MINERALS-ENERGY COMPLEX

1960	1965	1970	1975	1980	1985
68.3%	64.6%	52.3%	53.5%	37.4%	48.0%

Represents the cumulative proportion of outstanding capital advanced to industrial undertakings in the following sub-sectors; Chemicals, Rubber, Plastics, Non-metallic Mineral products, Basic Iron and Steel Industries, Non-ferrous Metals.

Source: IDC Annual Reports (various years).

The reality of the MEC has partly been obscured by the way in which statistics are traditionally constructed and interpreted in terms of a divide between mining and manufacturing and by the limitations of models of economic development. This is often compounded by a particularly Eurocentric "stages" interpretation of

5 This is not apparent from statistics presented in this chapter but has been clearly illustrated by Zarenda (1992, p.33, Table 5).

6 Financial Mail 17-5-91.

development, which views primary production as a transitory and essentially backward component of an economy.[7]

The statistical divisions between agriculture, mining and manufacturing are reflected in the models that are the creations of various economic and development theories. Whether one uses a neo-liberal, Keynesian or post-Keynesian framework, country models are designed either for developed or underdeveloped economies. The latter are largely primary commodity exporters, either dependent on minerals or agriculture. The key issue of the development path is interpreted in terms of the relative growth of different sectors, with targeting of the manufacturing sector for growth.

A good example of this was the Kleu Report's (1982) analysis of post-war industrial policy. Sectoral contributions were measured in terms of output, employment, capital-intensity and impact on the balance of payments. The subsequent comparison between mining and manufacturing was one of "either/or"; either use scarce resources to support primary production or support manufacturing. It is unclear why the study acknowledged the growing forward and backward linkages between agriculture and manufacturing, yet failed to apply a similar analysis to mining, Kleu (1982):

> Apart from its direct contribution to economic growth, agriculture's supporting contribution is also significant. Agriculture continues to be an important earner of foreign exchange, while the linkage effects between agriculture and manufacturing industry are significant and becoming stronger. Forward linkage effects of agriculture are taking place mainly because of the supply of raw

[7] The traditional construction of statistics has other serious policy implications for it a) usually disregards the informal sector, or regards it as a separate sector de-linked from mining and manufacturing; and b) ignores the contribution of unpaid and undervalued labour, usually female.

> materials, particularly for food processing, the production of liquor, tobacco and textiles and leather and timber processing. Together these industries are responsible for 25% of the total manufacturing output. Backward linkage is also important and has a bearing on purchases by agriculture and on production inputs.

This is even more surprising given that the report's only reference to mining's backward linkages was to acknowledge that major developments had taken place in the mining equipment industry, attributing this to favourable aspects of technology policy and research and development expenditure.[8]

Kleu argued that, while manufacturing was the fastest growing and most important sector of the economy, growth had been confined largely to the metal product, machinery and transport equipment sub-sectors but that manufacturing was the largest net consumer of foreign exchange and was more capital-intensive than primary production sectors. Since Kleu's analysis only partly recognised the MEC and was based on the mining/manufacturing division, his recommendations were piecemeal and diffuse; namely that primary production should be encouraged to its maximum potential, while selective targeting of particular manufacturing sub-sectors was required (with the state playing an indicative role).

Levy (1992) has also partly recognised the centrality of the chemicals component of the MEC, noting its relative ease in appropriating resources for expansion. In a preliminary analysis of the South African petrochemical feedstock industry (Sasol, in particular), Levy adopts an integrated approach by not viewing the "chemicals" and "plastics" sectors as individual

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[8] Kleu (1982, Para. 6.33, p.121).

entities, except to measure static capital productivity for comparative purposes. Although he goes much further, drawing out the linkages and the integrated nature of the fuels/energy/chemicals complex, Levy does not extend his analysis across the manufacturing/mining or manufacturing/energy divides where there are major interlinkages.9 Nevertheless, Levy's approach results in a far more useful analysis and assessment of the potential for profitable and market-oriented investment in further downstream chemicals processing. Such an analysis is however less useful in evaluating the choice that an economy with scarce capital resources might face in the future, namely, whether R2 billion should be spent on an export-oriented naphtha cracker or whether it might better be utilised in creating employment in, say, rural infrastructure or in the garments industry, (see below).

The growth of the MEC has also been obscured by the fact that economic development and planning in South Africa have been conducted through the collaboration of state policy makers and the corporate sectors (public and private) within a strategic framework of military intervention and apartheid exploitation. Analysis and policy evaluation have been further clouded by the cumbersome and unsystematic protection policies that typify the economy. Protection has not been a major policy instrument that the apartheid state has used to nurture industrial development. There has been a parallel strategy of direct intervention through the creation of specific industries in decentralised "growth points" chosen for their proximity to Bantustans which, by most accounts, have failed. Notable exceptions are in areas where MEC linkages took root; Newcastle, Witbank/ Middelburg, Richards Bay and Bophuthatswana/Rustenburg.

The substantial technical achievements of the MEC have been accompanied and even facilitated by the

9 For example, Sasol mines and converts about 20% of all coal mined in South Africa.

centralisation and concentration of capital, the entire process being underpinned by state intervention. Ownership of large sections of the economy have reached an advanced stage of concentration, whereby six "axes" of capital dominate almost every sub-sector of mining, manufacturing and the financial sector, (see chapter 2), yet current analyses of industrial development in South Africa tend to overlook these factors. Industrial policy proposals based on the mining/manufacturing divide, recently put forward by an important representative of the corporate sector, Sacob (1991), regards mining as a more or less, isolated sector, contributing only 7.5% of manufacturing inputs. These inputs are viewed in terms of providing a competitive advantage to manufacturing. A misleading impression of the basis of South African exports is given by dividing South African exports into gold and merchandise exports. No account is taken of the differences between resource-based economies and those without natural/mineral resources, (figure 1.13). South Africa's manufacturing sector (25% of GDP in 1988) is compared to Taiwan's (41%) rather than to resource-based economies like Canada (23%), Mexico (26%) or Turkey (26%). The only attempt made to disaggregate the manufacturing sector is in order to demonstrate state intervention though levels of effective protection.

The Sacob document was devoted to highlighting the competitive disadvantages inhibiting manufacturing sector growth, namely cost and productivity of capital and labour and costs of intermediate inputs. The high costs of capital are attributed to prevailing policies which keep tax, interest and inflation rates high. Import tariffs and protection raise the costs of intermediate inputs and capital goods and result in reduced productivity. Exorbitant labour demands, they also argue, have raised production costs without corresponding productivity gains. Although Sacob acknowledges growth in beneficiation, they argue that the above inhibiting

factors have prevented greater levels of beneficiation. The policy recommendations that flow from this centre on the elimination of the causes of competitive disadvantages; in particular, that the state should act to reduce the cost of capital, to reduce the power of organised labour and to reduce the cost of intermediate inputs and capital goods. The overall emphasis is on reducing the role of the state in the economy and to encourage emulation of selected policies pursued by successful newly industrialised economies (NICs) like Taiwan, South Korea and Singapore, namely an outward orientation, with an emphasis on subordinating the economy towards increasing manufactured exports.

What is overlooked in these arguments are the extremely high degrees of NIC state intervention in support of specific fractions of capital. This was accompanied by an initial autarchy and inward-orientation, a brutal political repression that accompanied rapid accumulation and favourable geo-political factors that virtually guaranteed political "stability", currency convertibility, access to capital and access to the huge markets of developed market economies. The evidence presented in this chapter suggests that current popular comparisons between the South African economy and the economies of successful late developers like Taiwan, South Korea and even Japan must proceed cautiously. While much attention has been given to state policies, institutions, production methods, marketing strategies, geo-political, social and other factors that contributed to their measured success as "manufacturing" economies, insufficient attention is given to the starting point of the productive bases of their respective economies. The economies of the NICs were never based on a Minerals-Energy Complex and, therefore, their development trajectory, quite appropriately, focused on manufacturing exports. The danger, therefore, is that the policy emphasis on the

"manufacturing" sector that is emerging might lead to serious misallocation of the scarce resources that will be available in post-apartheid South Africa.

CONCLUSIONS AND POLICY IMPLICATIONS

The process by which the MEC has occupied a central position within the economy cannot be explained by input-output analysis. Explanations lie in the realm of political economy. Past interventions by the South African state have succeeded in creating a highly capital-intensive MEC with ownership concentrated in the hands of what were previously distinguished as "English" and "Afrikaner" capital. While these distinctions are less relevant today, they constituted a disjuncture between economic and political power which was eroded through the development of the MEC, chapters 3 and 4.

The main policy implication here is that the MEC as a whole, today, contributes more to GDP than non-MEC manufacturing and also constitutes a site of comparative advantage, either requiring little state assistance, or being able to call upon it, in order to be competitive. Due to its size, integration and institutional relationships, the MEC acts as a magnet to capital for further expansion. With the exception of major housing programmes that are being mooted or implemented, driven largely by present political considerations, the bulk of national capital expenditure is being allocated to minerals- and energy- related projects. For example, the R3 billion Columbus stainless steel project is a joint venture between the Anglo American Corporation's Highveld Steel and Sanlam's Genmin. Other recently announced major capital expenditure projects relate to the upgrading of oil and coal-based fuel refineries and coal-based petrochemical projects. Most of these MEC projects are commercial ventures which require little state support. The only support given is a one-off capital subsidy to

counter the high cost of capital. This is in the form of an accelerated tax write-off in the year of expenditure. The only other manufacturing sector projects of note are a) the expansion of the beer monopoly, South African Breweries, a sector which is financially outside the MEC today but held within the conglomerate structure that dominates the economy.10 b) Several motor component industry investments directed at exports. For example, two platinum based autocatalyst exhaust plants have been opened in 1991, geared solely to the export market. However, the latter's existence is based on the continuation of export incentives to encourage higher local content in the motor industry. It is unclear how many of the projects associated with the motor industry would be economically viable without the current export incentive schemes and what their position is likely to be when the Phase VI incentives expire in 1996. Furthermore, recent revelations of foreign exchange fraud around the export incentive scheme are of particular concern.

The integrated nature of the MEC is also illustrated by the contraction of certain parts of the MEC, due to the knock-on impact on other MEC components. The most recent example lies in the rationalisation of the gold mining industry. Recent comparisons of individual South African mine working costs have implied that, at about $300/oz, 40% of South African gold mines would be uneconomic producers. Subsequent rationalisation has been borne directly by black mineworkers as mines scale-back operations, even sub-contracting the mining of some mine shafts. Contracting demand has directly affected manufacturing and other sectors supplying mining inputs, such as the electricity industry.

Corresponding closures of Escom power stations have had an adverse impact on tied coal suppliers. The net

10 Although this was not the case at the turn of the century when alcohol played a major role, both as a site of accumulation and as a means of social control, until it began to affect mine output. See Van Onselen (1982).

pressure of Escom's 35%-40% excess power has prompted it to forge new relations within the MEC. This involves a possible 25% equity participation by Escom in the R3 billion Alusaf aluminium smelter expansion, partly in return for a 20 year contract to supply electricity to the smelters at a price linked to the international price of aluminium. This is consistent with the historical orientation of the electricity parastatal's supply pattern, which has been to support mining and large-scale, energy-intensive industry. The role of such an agency has differed in other countries where electric utilities have often supported more socially motivated development patterns, rather than involving themselves solely in industrial projects.

To off-set the overall national impact of dependence on the MEC, monetary authorities have managed a controlled devaluation of the rand, which has compensated MEC core industries. This, in turn, has set in motion a comparative shift in the positions of sectors both within and without the MEC, widening the divide between the MEC core and non-MEC industries.

A second policy implication focuses on non-MEC manufacturing in relation to the MEC. Here the MEC can be regarded as a core, resulting from past interventions, that is so integrated and entrenched, in both linkage and institutional power terms, that it will naturally crowd out the development of any other industrial sector unless there is further intervention to prevent this. The traditional mining/manufacturing interpretation of the economy leads to a piecemeal policy focus on beneficiation of mineral products, justifying intervention to support some of the MEC's individual parts which, by themselves, appear to have no existing static comparative advantage. The policy challenge that flows from recognising the existence of the MEC and its inherent comparative advantage is, firstly, to focus on

non-MEC industries and, secondly, to strengthen systematically the weak linkages between the MEC and non-MEC industries. This does not preclude selective targeting of sectors within the MEC but any further intervention to strengthen the role of the MEC in the economy needs to be balanced against the potential lost opportunity costs in favouring other sectors of the economy. This has recently been the site of debate.[11]

Since the IDC's planned future interventions will further the centrality of the MEC within the South African economy, then the magnitudes of capital required will, firstly, most definitely crowd out other investments and, secondly, will place major demands on the financial system. Foreign borrowings are likely to be needed and this will have other, potentially adverse knock-on effects on overall development of non-MEC sectors, if it is accepted that trade is not always mutually beneficial once relations of power figure in determining prices. This is important in policy formulation, particularly for the South African economy, whose export base is firmly rooted in cyclical commodities (both raw and beneficiated). If present policies of strengthening the MEC continue, corresponding cyclical patterns should be expected in future balance of payment projections and specific policies need to be developed to counter declining terms of trade associated with primary and secondary commodity producers.

Failure to appreciate fully the dynamics of the economy through the MEC is also reflected within the democratic movement (Cosatu/ANC) although their policymaking is probably far more advanced than within official structures. Sustainable policy formulation and implementation is a process and not simply the drawing up and ratification of a multitude of documents and plans by corporate Boards and state bureaucracies. While there are

[11] See Rustomjee and Seidman-Makgetla (1992) and Van der Merwe (1992).

important differences between the approaches of business and the democratic movement, both tend to take the mining sector as given with little future potential but with one major drawback.12 This sector is increasingly being viewed as a political and economic millstone around the neck of a future state, particularly in terms of the potentially redundant but organised and militant labour it employs. For business, policy implications that flow from this include state intervention to limit labour's wage demands while policy debates within the democratic movement range between direct intervention and institutionalised enskilling and retraining.13 In both cases, there is reference to the need for "beneficiation" of mineral products but very little substance on how this might be achieved through a process which, firstly, prevents the MEC from appropriating a disproportionate share of national resources and, secondly, which ensures that other sectors of the economy do not become progressively more de-linked and underdeveloped in relation to the MEC

This chapter has argued that an understanding of the linkages between sectors and the relationships between agencies that constitute the Minerals-Energy Complex are essential prerequisites to any current restructuring of industry and any alternative post-apartheid restructuring. A negotiated national political settlement means that the agents involved will adopt positions that best defend their interests. Given that the confluence of these interests have been played out in the context of an increasing dependence on the MEC, a careful assessment of their dynamics and interplay will be required if the objective is either to build upon or to move away from the MEC. Whatever the outcome, there is a clear and

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12 There are differences. The Sacob position subordinates the economy to manufacturing export-led growth, while the democratic movement tends to support the restructuring of the industry to meet domestic basic needs.

13 Sacob (1991) argues for "A national wage and productivity policy which will give due regard to the necessity to maintain a relation between wages, productivity and the rate of inflation."

urgent need for broader debate before action is taken by any agency or party to strengthen the MEC, action which might, through its sheer magnitude, result in further unsustainable development of the South African economy.

THE MEC AS AN ANALYTICAL CONCEPT

In this chapter, the MEC has been referred to as a core set of industrial sectors which exhibit very strong linkages between each other and relatively weaker linkages with other sectors listed in input-output tables. However, subsequent chapters also refer to the MEC as a system of accumulation. This addendum serves to explain the difference in the uses of the term Minerals-Energy Complex for two reasons; firstly to avoid confusion and, secondly, to outline the methodological position occupied by a concept which can be applied to interpret and explain the process of industrialisation in the specific context of South Africa. There is no presumption that the MEC is applicable to other countries since it has been analytically developed in the specific context of the South African economy. The MEC, as a system of accumulation, addresses the process by which the core set of industries outlined above have developed historically and, correspondingly, have influenced how other sectors have developed.

The methodology adopted in the thesis builds on strong input-output linkages exhibited within the MEC core sectors. Chapter 2 outlines important political and economic counterparts to the strength and cohesiveness of the core, namely the form of ownership and control of the core sectors. Here it is shown that, while conglomerate ownership dominates both the MEC core industries, control also extends to other non-MEC sectors. In the specific South African context, conglomerate power over the economy, reinforced through simultaneous control of the financial sector, is shown to extend to all activities

and sub-sectors within mining, manufacturing and financial activities. This is specific to South Africa.

The MEC, as a system of accumulation, refers to the process by which accumulation is carried out within the broader economy, not just within the MEC core. One reason for this is that, in the specific South African case, conglomerate control across all productive sectors means that, even though strong linkages have been demonstrated within MEC core sectors, the process of accumulation has encompassed all other sectors continuously, with varying intensities, at different points in time and with different outcomes. Some of this complexity is outlined in Chapters 3, 4 and 5 which trace the political economy of industrialisation from the inter-war period to the present day, covering developments in both core MEC sectors as well as other industrial sectors and, where relevant, showing how relationships between various arms of the state and private capital as well as the role of the financial sector have led to the particular structure and location of the sectors defined as lying within and without the MEC core. The way these relationships have manifested themselves in the process and outcome of industrialisation is referred to in this thesis as the MEC as a system of accumulation. Sectorally, this system includes those sectors outside the MEC core industries, but this does not contradict the simultaneous understanding of the MEC as comprising a core set of industrial sectors. Instead, the analysis of the system of accumulation is tailored to unravelling the specific process of South African industrial development through an analysis of the internal dynamics and empirical outcomes of industrialisation in the context of a particular evolution of economic and political power.

As a system of accumulation then, the MEC potentially encompasses all economic sectors, since these have necessarily been associated with each other, through

ownership and control, through relationships between state and capital or through the imperatives of apartheid. Some ambiguity necessarily arises over the boundaries between MEC (core) and non-MEC sectors since multiple criteria of (non)-membership arise - by core sector or not, by political and economic and functioning forms of control, by the linkages in input and output tables. Thus, the arbitrary boundary around the MEC core, drawn in Chapter 1, does not extend to the engineering industry, the subject of Chapter 6, although the latter has long been associated with MEC core sectors. There are a number of reasons for this. Firstly, in the South African instance, engineering sector activity, although closely linked to, is shown to have been subordinate to MEC core sectors in the sense of limited diversification from serving the core sectors. Secondly, then, the purpose of singling out engineering is to demonstrate how, as a system of accumulation, the MEC has followed a limited and narrow pattern of industrial development and that the reasons for this lie outside the fact that close linkages existed between the MEC core and engineering. Precisely because much engineering has been closely linked to the MEC core, it is limited in scope as a reflection of the evolution of the MEC as a system of accumulation. Ownership may have been incorporated across from the core to the engineering subsectors but many of the input-output linkages (a separate criteria) have remained weak.

Similarly, the concept of the Military-Industrial Complex (MIC) is very different to that of the MEC. In a review of the literature Fine (1992) has shown that there are generally two views of the MIC. The first, views the MIC as a "critical mass of agencies and linkages that gives it a uniquely significant presence and momentum". The second view sees the MIC more as a systemic mechanism within an economy to counteract stagnation derived from underconsumption. Both of these perspectives loosely and

respectively resemble the concepts of the MEC as both a core set of sectors as well as a system of accumulation. However there the similarity ends for, in both cases, the MIC concept has been shown to be unsustainable in providing an adequate explanation of the pattern of industrialisation. The MIC theory, "which provides a framework within which to organise empirical material...leaves it vulnerable to criticism that it is no more significant than other 'complexes' such as the welfare or education lobbies", Fine (1992, p.1). In short, and in contrast, the MEC has constituted a core set of activities whose weight has been heavily influential over the direction of the economy as a whole. For the concept, or some other version of it, to be operative for other countries, it would be necessary to demonstrate empirically that the economic and political factors involved were equally powerful and influential.

APPENDIX 1 - ISIC MANUFACTURING CATEGORIES

FOOD
BEVERAGES
TOBACCO & TOBACCO PRODUCTS
TEXTILES
WEARING APPAREL (EXCL. FOOTWEAR)
LEATHER & PRODUCTS OF LEATHER & LEATHER SUBSTITUTES
FOOTWEAR
WOOD
WOOD & CORK PRODUCTS (EXCL. FURNITURE)
FURNITURE & FIXTURES
PAPER & PAPER PRODUCTS
PRINTING, PUBLISHING & ALLIED INDUSTRIES
INDUSTRIAL CHEMICALS
OTHER CHEMICAL PRODUCTS
RUBBER PRODUCTS
PLASTIC PRODUCTS (NOT ELSEWHERE CLASSIFIED)
POTTERY, CHINA & OTHER EARTHENWARE
GLASS & GLASS PRODUCTS
OTHER NON-METALLIC MINERAL PRODUCTS
IRON & STEEL BASIC INDUSTRIES
NON-FERROUS METAL BASIC INDUSTRIES
FABRICATED METAL PRODUCTS (EXCL.MACHINERY & EQUIPMENT)
MACHINERY (EXCL.ELECTRICAL)
ELECTRICAL MACHINERY, APPARATUS, APPLIANCES & SUPPLIES
MOTOR VEHICLES, PARTS & ACCESSORIES
TRANSPORT EQUIPMENT (EXCL.MOTOR VEHICLES PARTS & ACC.)
PROFESSIONAL & SCIENTIFIC, MEASURING & CONTROLLING EQUIP
PHOTOGRAPHIC & OPTICAL GOODS
OTHER INDUSTRIES

APPENDIX 2 - NOTES ON STATISTICAL SOURCES

Two major sources of mineral production statistics have been;

a)Minerals Bureau. These have been used to determine the extent of raw and processed minerals production and exports.

b)National Accounting/Foreign Trade Statistics. These have been the basis of input-output tables and have been used to determine forward and backward linkages between mining activities and the rest of the economy. They have also been used to determine contributions of the various economic sectors to gross domestic product.

MINERALS BUREAU - RAW MINERALS

Total annual raw minerals production and exports (tonnage and value) are published in South Africa's Mineral Industry Yearbook's (SAMI), Minerals Bureau. These statistics are reproduced by the Department of Mineral and Energy Affairs (DMEA) in their Annual Report. Categories of minerals are divided as follows:

PRECIOUS

Diamonds, gold, platinum group metals and silver.

METALLIC MINERALS

Antimony, beryllium, chrome ore, cobalt, copper, iron ore, lead, manganese ore, monazite, nickel, tantallite/colombite, tin, titanium minerals, uranium oxide, zinc, zirconium minerals.

NON-METALLIC MINERALS

Andalusite, asbestos, barytes, coal, corundum, feldspar, fluorspar, gypsum, kieselguhr, limestone and dolomite,

magnesite, mica, mineral pigments, nephaline syemite, perlite, phosphate concentrate, pyrophyllite, salt, semiprecious stones, silcrete, silica, sillimanite, sodium sulphate, sulphur, talc, vermiculite.

DIMENSION AND BUILDING STONE
Granite, marble, quartzite, schist, shale, siltstone, slate.

CLAY
Attapulgite, bentonite, fire clay, flint, kaolin, brickmaking

AGGREGATE AND SAND

MISCELLANEOUS
The Miscellaneous category includes several of the above minerals for which individual production statistics are classified secrets;

Precious	Diamonds, platinum group metals,
Metallic	Antimony, cobalt, monazite, tin, titanium minerals, uranium oxide, zirconium minerals.
Non-Metallic	Mica, phosphate concentrate.

MINERALS BUREAU - PROCESSED MINERALS

a)Ferroalloys: Chromium alloys, manganese alloys, ferromanganese, ferrosilicomanganese, ferrosilicon, silicon metal.
b)Aluminium
c)Vanadium
d)Other : Titanium slag, manganese dioxide, low manganese(ductile) iron, antimony trioxide.
e)Iron and steel

FOREIGN TRADE STATISTICS

Foreign trade statistics are published by the Commissioner for Customs and Excise under two classification systems.

a)Harmonised System - statistics published at the 8 digit level.

b)ISIC - statistics published at the 4 digit level.

NATIONAL ACCOUNTS

The national accounts classify industrial activity according to the Standard Industrial Classification. This divides mining and MEC manufacturing activities as follows;

Mining and Quarrying
coal (SIC 2100)
gold(SIC 2400)
diamonds (SIC 2700)
other mining (SIC 2200, 2300, 2800, 2900)

Manufacturing
a)Iron and steel basic industries (SIC 371):
basic iron and steel,
steel pipe and tube mills

b)Non-ferrous metal basic industries (SIC 372):
primary non-ferrous metal products (incl platinum)

c)Other non-metallic mineral products (SIC 361, 369):
bricks, tiles, refractories, cement, etc.

d)Fertilisers, pesticides, synthetic resins, plastics, other chemicals, basic chemicals and petroleum.(SIC 351-354)

CHAPTER TWO

OWNERSHIP AND CONTROL OF THE SOUTH AFRICAN ECONOMY - THE ROLE OF THE MINERALS-ENERGY COMPLEX

INTRODUCTION

The South African economy is dominated by six conglomerates which, because of their simultaneous control of the mining, manufacturing and financial sectors, are more usefully viewed as "axes" of capital. The historical process by which this particular corporate form has evolved in South Africa is discussed in other chapters and represents the operation of the MEC as a system of accumulation.

Section one analyses the extent of concentrated ownership by economic sector. Starting with the mining industry, the economy's dependence on gold is shown to have shifted to a broader range of minerals, in which the production of each is controlled by one or more of the six "axes". Conglomerate control extends into the manufacturing sector. In the first instance, it covers the activities immediately downstream of mining, including mineral processing and chemical production. Secondly, the industries that produce the key inputs for these sectors, particularly the enginering industries, are also characterised by conglomerate domination. Thirdly, all other sub-sectors of manufacturing exhibit considerable ownership concentration. The financial sector is also shown to lie within the sphere of control of the six "axes" of capital, and this has served to reproduce further and extend conglomerate control of other productive sectors.

Acknowledgement of conglomerate control of the South African economy is not novel. The corporate structure

that is outlined here is typical of modern capitalism, though the degree of concentration in South Africa may be more acute than exhibited in other developing and industrialised economies. In recent debates, concentration is acknowledged and interpreted in terms of the way it has (usually adversely) affected industrial performance.[1] However, from the perspective of the MEC, this stance forcibly separates the processes which led to concentration from the phenomenon of poor industrial performance.

The approach adopted in this thesis is that the process of concentration and conglomeration is seen, as will be shown in the chapters below, to be both a product of the economy's evolution around the MEC, as well as having had an impact on that evolution itself. Concentration of markets and conglomerate control of an economy does not by itself determine success or failure of industry, and the rest of the thesis demonstrates that the process by which the economy has evolved is better explained by reference to the MEC, rather than by a simplistic association with the increasing degree of economic concentration.

The South African economy is a "mixed" economy, in that there is both state and private ownership of productive sectors (agriculture, mining, manufacturing) and the financial sector. The extent of state ownership is outlined in Section two, where it is shown that, while state ownership of the productive sector is not large in comparison with private ownership, it is concentrated in sectors associated with the MEC. The historical relationship between state and private capital in the industrialisation process is dealt with in other chapters, but what is demonstrated here is that the state-owned sectors have fulfilled a particularly important function in lubricating the growth of MEC core

[1] See for example, Lewis (1993).

sectors and, simultaneously, the ascendance of large-scale private capital.

While the changing relationship between state and private capital is discussed in other chapters, the ownership of sectors around the MEC have involved a considerable degree of interpenetration between what was formerly referred to as English and Afrikaner capital as well as between them and the various state-owned corporations. The recent trend of privatisation should thus be seen as a continuation of this shifting relationship between the state and fractions of private capital.

In addition to its creation of industries in and around the MEC, the state, in its regulating role, is shown to have supported the emergence of large-scale capital which, as is demonstrated in chapter one, has concentrated its activity within the MEC core. This is discussed in Section three.

1. CORPORATE STRUCTURE AND THE MEC

Corporate structure has evolved and extended around the MEC core. The origins of the MEC lie in mining where the enormous economies of scale required by deep mining conditions, after exhaustion of surface gold deposits, led to early concentration of ownership.

> Out of the 576 gold mining companies floated on the Rand during the period 1887-1932...only 57 remained in existence in 1932...The 57 goldmining companies in existence in 1932 were, with some minor exceptions, controlled by six finance houses or groups.[2]

The conglomerate forms that have developed since then are extensions of this oligopoly, whose power, as will be shown, is rooted in the control of the financial sector. The economy has gravitated away from a dependence on gold and diamond mining to a range of other raw and processed minerals, (table 2.1). This has largely occurred during and after the 1960s, particularly in the growth of coal, ferro-chrome, platinum, vanadium and copper mining. The smelting and refining activities of many of these are measured, and discussed below, under the manufacturing sector.

2 Davies, R.H. (1979) quoting Frankel, S.H. (1938).

TABLE 2.1 - SOUTH AFRICAN MINERAL PRODUCTION, 1988

	TONS	ESTIMATED VALUE MILLION RAND	% SHARE OF TOTAL MINERAL VALUE(2)
GOLD	612	19687	54
COAL	180182000	5761	16
DIAMONDS	n/a	n/a	n/a
FERRO-CHROME(1)	1190000	3551	10
PLATINUM(1)	2580	3092	9
VANADIUM(1)	29545	1249	3
COPPER	168000	932	3
IRON ORE	25029000	560	1
MANGANESE ORE	3447000	354	1
LIME/LIMESTONE	15721000	320	1
CHROMITE ORE	3401000	316	1
NICKEL	n/a	n/a	n/a
URANIUM	4590	n/a	n/a
ZIRCON SAND	135000	176	<1
TITANIUM	n/a	n/a	n/a
ASBESTOS	109	n/a	
FLUORSPAR	358000	84	<1
SILVER	182	81	<1
SALT	794000	59	<1
ANTIMONY	8838	46	<1
		36268	100

Source: Central Statistical Service, Bulletin of Statistics.

(1) Item statistically recorded under the manufacturing sector. We have included it here since secondary processing is often carried out by subsidiaries of the major holding companies.
(2) This only represents the totals listed and should be regarded as indicative.

TABLE 2.2 - SOUTH AFRICAN MINERAL PRODUCTION, 1988 MARKET CONCENTRATION OF THE SIX MAJOR MINING HOUSES(%)

	ANGLO AMERICAN (3)(AAC)	RAND MINES (SA MUTUAL)	GENCOR (SANLAM)	JCI (AAC)	ANGLO -VAAL (FAMILY)	GFSA (FAMILY)	% of TOTAL MARKET
GOLD(1)	39	8	14	6	6	18	91
COAL(2)	23	20	21	3	-	4	71
DIAMONDS	100	-	-	-	-	-	100
FERRO-CHROME	-	27	42	13	8	-	90
PLATINUM	49	1	39	2	-	-	91
VANADIUM	77	-	-	-	-	-	77
COPPER	69	-	-	-	29	2	100
IRON ORE	?	-	-	-	?	-	30
CHROMITE ORE	3	30	42	-	9	-	84
ANTIMONY	-	-	-	100	-	-	100

Source: Rustomjee (1990).

(1)1989 statistics used for market share.
(2)1984 statistics used for market share.
(3)Ultimate controlling shareholder in brackets. Source: McGregor (1990).
(4)Information is not available. Iscor is the largest consumer of iron ore, owning most of its mines. Since privatisation, no clear ownership control of Iscor has emerged, but AAC, SA Mutual and the IDC hold significant stakes.

TABLE 2.3 - MEASURES OF CONCENTRATION

	C4 CONCENTRATION % (1)
HIGHLY CONCENTRATED	>75
CONCENTRATED	50 TO 75
MILDLY CONCENTRATED	25 TO 50
NOT CONCENTRATED	<25

Source: Alcorto (1990).
(1) C4 represents the cumulative market share of the four largest firms.

Table 2.2 illustrates the extent of oligopoly in the production of the most valuable minerals. The subsidiaries of six large mining houses namely Anglo American (AAC), Anglovaal, Rand Mines (SA Mutual), Genmin (Sanlam), Gold Fields of South Africa (GFSA) and

Johannesburg Consolidated Investment (AAC) dominate the production and marketing of all individual mineral markets. With the exception of iron ore, a combination of the six conglomerates mine more than 70% of all major minerals in South Africa. Bain (1951) has suggested that significant monopoly or oligopoly power is indicated if the eight largest firms (C8 ratio) control more than 70% of the market. Alcorto (1990) argues that such ratios are largely a matter of degree but that a C4 ratio of 75% can be regarded as significant, (table 2.3). Even if Alcorto's more conservative indicators are used, the production of most minerals fall into the "highly concentrated" category. In any case, the purpose here is less to highlight individual market dominance and more to illustrate the pattern of evolving economic dominance of large-scale capital.

For the MEC core has expanded out of mining, through downstream mineral processing activities carried out by subsidiary companies of the conglomerates. Such statistics are measured within the manufacturing sector, which exhibits an oligopolistic pattern of market control and a concentration of ownership among the same conglomerates that control the mining sector.[3] About 37% of the manufacturing sector's output is from MEC sectors including the steel, chemical and mineral processing industries, each of which is dominated by one or other conglomerate. Each of these sectors is highly concentrated, with the C5% index (ie.the cumulative market share of the dominant 5% of firms) above 75%, (table 2.4).[4] Engineering sectors exhibit slightly lower C5% concentration ratios. The engineering industries are shown in chapter six to have been historically linked to the development of the MEC core both in ownership terms

3 See Fourie and Smit (1989), Tregenna-Piggott (1976), (1979) and (1980), Dollery (1983) and Du Plessis (1978).

4 Fourie and Smit (1989) have also demonstrated this tendency using the Gini Coefficient (or quantitative indicator of the Lorenz curve) and provide a discussion of the pros and cons of these widely accepted indicators.

and in providing a large proportion of MEC inputs. Non-MEC industries exhibit similar, highly concentrated ownership structures and demonstrate that oligopoly in South Africa is not only confined to industries requiring large economies of scale, (table 2.4). This is confirmed, for example, in table 2.7 by the dominance of SA Mutual's subsidiaries in the food industries.

TABLE 2.4 - MANUFACTURING SECTOR CONCENTRATION INDEX, MARKET SHARE OF TOP 5% OF FIRMS

	(1) VALUE OF SALES 1988 BILL.RAND	(2) 1972	(2) 1982
MEC INDUSTRIES			
INDUSTRIAL CHEMICALS	7.3	55.2	77.0
OTHER CHEMICALS	15.3	51.7	76.0
RUBBER	1.8		
PLASTIC	2.2	37.2	55.8
NON-METALLIC MINERALS	3.5	67.4	77.1
IRON AND STEEL	10.8	71.3	78.3
NON-FERROUS METALS	3.2	46.7	51.3
	44.1		
ENGINEERING INDUSTRIES			
FABRICATED METAL	7.1	57.2	64.5
MACHINERY	5.4	51.5	62.4
ELECTRICAL MACHINERY	6.0	59.0	66.5
MOTOR VEHICLES	12.2	79.0	82.4
TRANSPORT EQUIPMENT	1.2	69.3	73.8
PROFESSIONAL & SCIENTIFIC	0.4	52.4	60.6
	32.3		
NON-MEC INDUSTRIES			
FOOD	17.4	56.4	66.4
BEVERAGES	5.2	74.3	60.6
TOBACCO	1.3	n/a	n/a
TEXTILES	4.6	44.9	55.1
WEARING APPAREL	2.6	46.3	48.3
LEATHER	0.7	34.1	48.2
FOOTWEAR	1.3	40.2	42.2
WOOD AND CORK	1.9	43.1	58.2
FURNITURE	1.0	49.6	50.0
PAPER	5.8	45.5	64.0
PRINTING & PUBLISHING	2.5	61.2	61.9
	44.3		
TOTAL (ALL SECTORS)	120.7		

(1) Source: Central Statistical Service, Bulletin of Statistics.
(2) Source: Fourie and Smit (1989).

Du Plessis (1977), (1978) and (1979) demonstrates that the manufacturing sector exhibits higher levels of concentration than France, West Germany, U.K. and Italy. Although one would expect South Africa, a relatively

smaller economy, to have greater levels of concentration, the trend in concentration has actually been increasing. As early as 1972, 63.5% of manufacturing industries classified under the Standard Industrial Classification were regarded as highly oligopolistic, (table 2.5). Data to update these are not available but, since mergers and acquisitions accelerated in the 1970s and 1980s, it is reasonable to assume that this trend has increased.[5]

TABLE 2.5 - SOUTH AFRICAN MANUFACTURING SECTOR MEASURES OF OLIGOPOLY, 1972

	No.Firms with >80% industry's turnover	Cumulative % of industry
MONOPOLISTIC	1	6.6
DUOPOLISTIC	2	15.4
HIGH-OLIGOPOLISTIC	3-10	63.5
MODERATE-OLIGOPOLISTIC	11-15	74.6
LOW-OLIGOPOLISTIC	16-20	77.9
UNCONCENTRATED	21-40	90.6
COMPETITIVE	41+	100.0

Source: Du Plessis (1978).

Ownership of manufacturing firms can be traced to the six large conglomerates that dominate mining in two ways. First, it is reasonable to consider ownership on the Johannesburg Stock Exchange (JSE) as indicative of the ownership structure of manufacturing since the magnitude of ownership by the state, by domestic or by transnational corporations outside of the JSE is small in comparison. In 1988, 82.5% of the entire JSE was controlled by the six conglomerates, (table 2.6), three of which were dominant. The changes between 1985 and 1988, in table 2.6, are due to changing corporate structures through mergers and acquisitions as well as changing stock valuations. The predominance of gold shares in Anglo American's portfolio in particular, has

5 Du Plessis (1977) and (1978) had access to unpublished official data.

contributed to the relative decline in its share since October 1987.

Secondly, the conglomerates exercise control over these industries through pyramid, or holding companies which provide control without a significant outlay of capital. An examination of the distribution of the largest 100 listed companies by asset size, reveals extensive use of the holding company as a vehicle of conglomeration and a corresponding concentration of ownership of these companies, (table 2.7).

TABLE 2.6 - OWNERSHIP OF SHARES ON THE JOHANNESBURG STOCK EXCHANGE, (%)

	1985	1988
ANGLO AMERICAN	53.60	49.5
SANLAM	12.20	10.8
S.A MUTUAL	10.60	9.8
REMBRANDT	3.80	7.6
ANGLOVAAL	2.10	2.2
LIBERTY LIFE	2.00	2.6
	84.30	82.5

Source: Rustomjee (1990) using McGregor (1990).

TABLE 2.7 - OWNERSHIP OF LARGEST LISTED INDUSTRIAL COMPANIES, 1988

	TURNOVER R.Million	PARENT
HOLDING COMPANIES		
BARLOW RAND	21115	SA MUTUAL
CG SMITH	10064	SA MUTUAL
MALBAK	5234	SANLAM
ANGLOVAAL INDUSTRIES	3712	HERSOV/MENEL FAMILY
AMIC	3546	AAC
MURRAY & ROBERTS	3039	SANLAM
FEDVOLKS	2864	SANLAM
SAFREN	2799	SA MUTUAL
PLATE GLASS	2324	SA MUTUAL/LIB.LIFE
SOUTH ATLANTIC	1120	ANGLOVAAL
W & A	706	FSI DIRECTORS
HUNTS	539	FSI DIRECTORS
PICHOLD	488	PICKARD FAMILY
CULLINAN	415	SA MUTUAL
BTR DUNLOP	411	BTR PLC
SA BIAS	N/A	SEABROOKE FAMILY
DARLING & HODGSON	397	SANLAM
FSI	284	FSI DIRECTORS
GRINCOR	275	DIRECTORS
FOOD SECTOR		
CGS FOODS	6863	SA MUTUAL
TIGER OATS	4395	SA MUTUAL
PREMIER GROUP	3204	AAC
ICS	1666	SA MUTUAL
FEDFOOD	1010	SANLAM
I & J	890	ANGLOVAAL
KANHYM	801	SANLAM
GANTS	220	DIRECTORS
CHEMICALS/OILS SECTOR		
SASOL	3615	STATE
AECI	3276	AAC
SENTRACHEM	1254	SANLAM
TREK	785	SANLAM
SA DRUG	675	SANLAM
ADCOCK	335	SA MUTUAL
OM HOLD	181	DIRECTORS

Source: Rustomjee (1990) using Financial Mail, Top Companies Supplement, 19 May 1989 and McGregor (1990).

More recently, conglomerate ownership has extended to the financial sector. An important role of the financial sector in any economy is to collect, store and distribute national savings. Major institutions within the South African financial sector include commercial banks, merchant banks, pension funds, mining finance houses and (until recently) building societies. Banks have traditionally made loans and bonds to both state and private sectors and have specialised in financing trade through merchant banking interests. Building societies have traditionally operated in the long term financing of property, although with deregulation in the early 1980s, their position has changed (see below). Insurance and pension funds have traditionally made loans to the state and public sector and have channelled the balance of their large cash inflows onto the JSE, which itself is an important institution within South Africa's capital market.

The distribution of financial sector assets is illustrated in table 2.8. The actual occurence of concentrated ownership of the financial sector is less important than the sector's organic, facilitating and lubricating role in financing and linking the various mining, manufacturing and other productive sectors in a dynamic manner along a particular growth path. Oligopolistic control of the financial sector has not only contributed to the process of concentration and centralisation, but has also shaped the pattern of industrialisation itself around the MEC core. In 1988, commercial banks and long-term insurers deployed 59% of the financial sector's assets, the balance being spread between general and merchant banks and building societies. Table 2.9 shows that conglomerates dominate each of these specialised financial activities.

TABLE 2.8 - ASSETS OF THE FINANCIAL SECTOR, 1988

	BILLION RAND	%
PRIVATE SECTOR		
COMMERCIAL BANKS	82.7	30.7
GENERAL BANKS	28.1	10.4
MERCHANT BANKS	6.5	2.4
BUILDING SOCIETIES	36.0	13.3
LONG TERM INSURERS	77.6	28.8
PENSION/PROVIDENT FUNDS	38.9	14.4
	269.8	100.0
STATE SECTOR		
OFFICIAL FUNDS(1)	31.3	45.8
PUBLIC INVESTMENT COMMISSION(2)	27.8	40.7
LAND BANK	9.2	13.5
	68.3	100.0

Source: South African Reserve Bank, Quarterly Bulletin, March 1990.

(1) Administered by SATS and Dept. of National Health and Population Development
(2) The PIC administer public sector pension funds.

Direct control over financial sector assets in 1988 were as follows; SA Mutual R52.9b; Anglo American R41.0b, Sanlam R38b and Liberty Life R21b, (table 2.9). Indirect or joint control increases this significantly, reinforcing the contention that the financial sector is under oligopolistic control. This does not mean that no competition exists between finance houses, but the basis of competition is a narrow one characterised by capital-intensity (South Africa has one of the highest ratios of automated telling machines in the world, higher than the UK and FRG),[6] speculative activity like the channelling of funds onto the stock market causing it to boom during recessions, and in activities that attempt to circumvent capital controls (see below).

6 For further details on automated banking see, Weekly Mail, 1 June 1990.

Liberalisation policies pursued by the state between 1980 and 1983 lifted controls over interest rates, exchange rates and on activities of various sectors within the financial system. Traditionally, building societies competed ineffectively with banks for individual savings accounts and their capacity to compete was enhanced in the short term by deregulation through a new Building Societies Act which allowed them to convert themselves from mutual organisations owned by their depositors to companies which could raise funds through, for example, share issues. However, in the longer term, this has paradoxically encouraged the tendency to concentration by allowing existing monopolies to buy up the building society competitors. Those societies that converted, namely UBS, Allied, NBS and Saambou have all fallen within the orbit of the major conglomerates while the Perm, which is the only society to remain a mutual, is now a division of Nedbank and thereby controlled by Sanlam. One result of this is the recent emergence of the Amalgamated Banks of South Africa (ABSA) as the largest banking group, representing the merging of Volkskas, United, Allied, Bankorp and Trustbank, largely Afrikaner-oriented institutions.

In conclusion, the structure of private corporate capital in South Africa is represented by six broad-based, organically linked "axes" of capital each with varying interests in mining, manufacturing and the financial sector. Three of these (SA Mutual, Sanlam and Anglo American) control a long term insurance group, a commercial, general or merchant bank, and/or a building society, an industrial holding company and a mining holding company. The Liberty/Standard and Rembrandt/Volkskas axes are more active the financial sector level while Anglovaal is more concerned with direct investments in manufacturing and mining industries.

The SA Mutual axis involves SA Mutual - Nedbank - UAL/Finance Bank - Perm Building Society - Barlow Rand - Rand Mines.

The Sanlam axis involves Sanlam - Trust/SANTAM Bank - Senbank - (no building society) - Gencor - Malbak.

The Anglo American axis involves Southern Life - First National Bank - First Corporate Bank - (no building society) - AMIC - AMGOLD/AMCOAL/DE Beers/JCI.

The Liberty/Standard axis involves Liberty Life - Standard Bank - Standard Merchant Bank - (no building society) - (no direct mining/industrial arms).

The Rembrandt/Volkskas axis involves Lifegro/Federated Life - Volkskas/Boland - Rand Merchant Bank - United Building Society - Remgro - GFSA.

Anglovaal operates relatively independently of financing with some Sanlam and SA Mutual influence in their mining and industrial holding companies.

TABLE 2.9a - OWNERSHIP OF FINANCIAL SECTOR ASSETS, 1988 - COMMERCIAL AND GENERAL BANKS

	BILLION RAND	ULTIMATE CONTROLLING SHAREHOLDER	
COMMERCIAL BANKS			
First National	24.9	ANGLO AMERICAN	
Standard	19.9	LIBERTY LIFE	30%
		SA MUTUAL	23%
		REMBRANDT	13%
Trust Bank	12.8	SANLAM	
Volkskas	10.3	REMBRANDT	30%
		UBS HOLDINGS	30%
Nedbank	8.9	SA MUTUAL	
	76.8		
GENERAL BANKS			
Santambank	5.7	SANLAM	
Stannic	5.2	As per STANDARD above	
First Western	4.4	ANGLO AMERICAN	
Boland Bank	2.2	REMBRANDT	10%
		VOLKSKAS	10%
		LIFEGRO	9%
		SANLAM	7%
Allied Bank	2.1	MINORITY SHAREHOLDERS	
		REMBRANDT	10%
		REMBRANDT	4%
First Industrial	1.9	ANGLO AMERICAN	
Nedfin	1.7	SA MUTUAL	
French Bank	0.8	N/A	
Volkskas Industrial	0.7	REMBRANDT/DIRECTORS	
Syfrets Bank	0.5	SA MUTUAL	
United Bank	0.5	MINORITY SHAREHOLDERS	
	25.7		

Source: Rustomjee (1990) using Financial Mail, Top Companies Supplement, 19 May 1989 and McGregor (1990).

TABLE 2.9b - OWNERSHIP OF FINANCIAL SECTOR ASSETS, 1988 - MERCHANT BANKS, BUILDING SOCIETIES, INSURERS & PENSION FUNDS

MERCHANT BANKS			
Senbank	1.5	SANLAM	
Standard Merchant Bank	1.1	As per STANDARD above	
First Corporate	0.8	ANGLO AMERICAN	
UAL Merchant Bank	1.1	SA MUTUAL	
Volkskas Merchant Bank	1.1	REMBRANDT/DIRECTORS	
Rand Merchant Bank	0.9	REMBRANDT	26%
		ALLIED	13%
Finansbank	0.7	SA MUTUAL	
Investec	0.8	DIRECTORS/STAFF	
Corbank	0.5	DIRECTORS	25%
		SANLAM	16%
		SA MUTUAL	13%
	8.5		
BUILDING SOCIETIES			
Perm	6.8	SA MUTUAL	
UBS	10.0	MINORITY SHAREHOLDERS	
		VOLKSKAS	10%
NBS	3.1	MINORITY SHAREHOLDERS	
Allied	6.1	MINORITY SHAREHOLDERS	
		REMBRANDT	10%
		REMBRANDT	4%
SAAMBOU	2.0	MINORITY SHAREHOLDERS	
		VOLKSKAS	9%
		SANLAM	8%
	28.0		
LONG TERM INSURERS			
SA Mutual	33.2	UNLISTED	
Sanlam	18.4	UNLISTED	
Liberty Life	14.8	STANDARD BANK/DONALD GORDON	
Southern Life	9.0	ANGLO AMERICAN	
Lifegro	3.9	REMBRANDT	30%
		VOLKSKAS	30%
Federated Life	2.7	VOLKSKAS	
	82.0		
PENSION/PROVIDENT FUNDS	38.5		
Total Financial Sector	264.7		

Source: Rustomjee (1990) using Financial Mail, Top Companies Supplement, 19 May 1989 and McGregor (1990).

TABLE 2.10 - OWNERSHIP OF FIXED CAPITAL STOCK (%)

	PUBLIC AUTHORITIES (1)	PUBLIC AUTHORITY BUSINESS ENTERPRISES (2)	PUBLIC CORPORATIONS (3)	PRIVATE BUSINESS ENTERPRISES
1949	44	-	3	53
1950	41	-	4	55
1955	39	-	5	56
1960	20	22	5	53
1965	22	22	5	51
1970	24	21	7	49
1975	24	20	9	46
1980	24	20	14	42
1985	23	19	15	43
1990	25	18	10	47

Source: South African Reserve Bank, Quarterly Bulletins.

(1) Public Authorities = Central Authorities, Provincial Administration and Local Authorities.
(2) Public Authority Business Enterprises = South African Transport Services (now Transnet and Portnet), Posts and Telecommunications, South African Mint, National Supplies Procurement Fund, Community Development Fund. Public Authority statistics were only disaggregated after 1960.
(3) Public Corporations = Escom, Iscor, IDC, Rand Water Board, Sasol, Uranium Enrichment Corporation (Ucor), Armscor, Atomic Energy Corporation (AEC), Corporation for Economic Development.

South Africa's "mixed" economy has evolved through close inter-relationships between the state, English and Afrikaner fractions of capital, particularly around the MEC. The extent of state involvement is reflected in its share of national fixed assets, (table 2.10). In the post-war period, the bulk of national fixed capital stock in industrial sectors has been privately, mainly conglomerate, owned. Private ownership of national fixed capital stock fluctuated between 50% and 55% between 1946 and 1960 before falling to 42% in 1980, (table 2.10). State sector investment has been of two sorts. Firstly it has been concentrated in specific large-scale MEC core

industries such as steel, chemicals, processed minerals and energy (liquid fuels and electricity). The Public Corporations' share of fixed capital stock grew from 5% in 1955 to 7% by 1970. Thereafter it accelerated to 15% in 1985, reflecting state-led direct investment in synthetic fuel, chemicals, steel, energy and armaments. This has declined in the 1980s, falling to 10% by 1990, as state-led investment fell,[7] and as state corporations like Iscor and Sasol were privatised. Private capital's share correspondingly rose with the privatisation from 43% to 47% between 1985 and 1990, reflecting the continuing process of its growth by acquisition rather than by new investment. The state has also provided indirect support to the MEC core through its provision of railway, harbour, fuel pipeline and telecommunication facilities and the share of such infrastructure has remained fairly steady between 22% and 18% in the post-war period.

Table 2.11 reveals a concentration of state assets in a handful of large corporations or organisations, several of which have either been or are in the process of being privatised. In 1986, of the R80b worth of assets, R63.5b was either directly or indirectly associated with the MEC.

The historical process of state involvement with private capital around the MEC is outlined in subsequent chapters. However, state-created industries have tended to provide the means by which the MEC core could be expanded. This began with the creation of the primary steel industry in the 1920s and continued through the nationalisation and subsequent investment in the under-capitalised electricity industry in 1948. Electricity has continued to provide a key impetus to the trajectory of

7 South African Reserve Bank, Quarterly Bulletins show total gross domestic fixed investment (GDFI) (at 1975 prices) rise from R5.6 billion in 1970 to R7.2 billion in 1979, reach a peak of R9.6 billion in 1981 before falling to R7.1 billion in 1988. Private sector share of expenditure was as follows: 1970 - 57%, 1979 - 47%, 1981 - 51%, 1988 - 67%.

industrialisation.[8] The Sasol I plant was the first large-scale support given by the state to the chemicals sector, extending the links between coal mining and the manufacturing sector, as will be shown below. One of the characteristics of state-ownership has been that it has often been accompanied by joint-ventures with domestic and international private capital.

TABLE 2.11 - FIXED ASSETS OF MAJOR PUBLIC ENTERPRISES, 1986

DIRECT AND INDIRECT MEC INDUSTRIES	Rm
ESCOM	35664
SATS	18614
ISCOR	3894
IDC	3058
ARMSCOR	1706
ALUSAF	500
FOSKOR	126
	63562
OTHER	
POST OFFICE	8297
LAND BANK	7939
	16236
TOTAL	79978

Source: McGregor, R. (ed.) (1987).

To summarise, the extent of state ownership of fixed assets in the productive sectors of the economy is relatively small compared to the private sector. But state investment is focused in, and supportive of, MEC core sectors. Furthermore, the control of investible surpluses is firmly in the hands of private capital. Prior to the privatisations after 1988, the state had direct control of only R68b of financial sector assets, whereas the private sector controlled some R270b, (table 2.8).

[8] The IDC Managing Director, van der Merwe (1992) argued that the decision to spend some R12b on an aluminium smelter and a stainless steel plant in 1992 was partly justified on the grounds of utilising the estimated 40% excess electricity generating capacity.

2.1 THE INTERPENETRATION OF CAPITAL AND THE MEC

Mergers and acquisitions have characterised the growth of the conglomerates since the early 1960s, when the Sharpeville massacre prompted a flight of foreign capital. Acquisitions increased dramatically in the 1970s and, in the 1980s, was accompanied by increasing interpentration of ownership particularly between English and Afrikaner capital. In subsequent chapters, the empowerment of large-scale Afrikaner capital is shown to have been a major political and economic objective of the apartheid state, which contributed to the emergence and interpenetration of large-scale capital, as embodied by the "axes". This took place at different times across the various sectors. Table 2.12 illustrates the ultimate controlling interest in each of the mining houses and the cross-holdings between them. Anglo American's interest in GFSA and JCI is significant as is Sanlam's interest in Anglovaal.

TABLE 2.12 - SOUTH AFRICAN MINING HOUSE CROSS HOLDINGS, 1988

	% OWNED BY PARENT/CONTROLLING INTEREST						
ULTIMATE CONTROLLING INTEREST	PARENT	ANGLO AMERICAN	RAND MINES	GENCOR	JCI	ANGLO -VAAL	GFSA
AAC	ANGLO AMERICAN	----		5.5	50.0		21.8
SA MUTUAL	BARLOW RAND		----	10.3	10.3	<10.0	
SANLAM	GENCOR			----		26.7	
AAC	JCI				----		
HERSOV/MENEL FAMILY	ANGLOVAAL				2.3	----	
REMBRANDT	GFSA						----

Source: McGregor (1990).

(----) denotes a controlling interest.

Extensive cross holdings are evident in the financial sector. Within the Anglo stable, First National

Bank (FNB) owns a large percentage of Southern Life which, in turn, has a large stake in FNB. Standard Bank, owned largely by Liberty Life, SA Mutual and Rembrandt, in turn owns 50% of Liberty's controlling company. UBS Holdings (listed) controls UBS and together with Volkskas control United Bank.

3. LARGE-SCALE CAPITAL AND ANTI-MONOPOLY REGULATION

One of the ways by which large-scale capital was empowered was through the support of the state in regulating capital in general. Direct regulatory policy on monopoly and competition has existed in South Africa since 1955 in the form of the Regulation of Monopolistic Conditions Act No.24 of 1955, which was governed by the Board of Trade and Industries (BTI) under discretionary control of the (then) Minister of Economic Affairs, who had powers to initiate and terminate investigations and negotiations. This was superseded by the Maintenance and Promotion of Competition Act No.96 of 1979 and modified by Act No.5 of 1986 which effectively increased the scope and power of the Competition Board (CB). Legislation in July 1990 appears to have further strengthened the powers of the Board.[9]

However, such legislation has never challenged large-scale capital. In the 1950s, the consolidation of Afrikaner capital and its deployment into large-scale mining and industrial activites was promoted. In the 1960s, both Afrikaner and English large-scale capital acquired footholds in a wide range of industries as foreign capital disinvested following the Sharpeville massacre. In the 1970s, the state promoted a wide range of industrial activity in expanding MEC core sectors which further enhanced joint-venture activity between English and Afrikaner capital under state coordination. With the fall in commodity prices and the growing crisis

9 "Sharper bite for board", Sunday Times, Business section, July 29, 1990, Page 3, Johannesburg.

of apartheid in the 1980s, coordinated policies, including those concerning ownership and control, diffused as policymakers increasingly embraced policies of deregulation and privatisation.

The National Party (NP) used its control of the state apparatus after 1948 not only to provide jobs for Afrikaners who, among whites, had been economically and politically marginalised by the preceding imperial epoch, but also to consolidate and build an Afrikaner economic base. Manufacturing at this time was controlled by a mixture of domestic and foreign capital while mining capital was more monopolised, dominated by mainly domestic or foreign (mainly) "English" capital. Commerce and finance was controlled by foreign capital although there was a significant and growing domestic presence.

The passing of the 1955 Act should be viewed in the context of the NP's diverse constituency, for subsequent NP policy was not to break-up existing monopolies but rather to force them to admit large-scale Afrikaner capital. Lipton (1986, p.286) quotes Verwoerd in 1957:

> the encouragement of local capital formation was one of the guiding principles of our financial policies during this past decade'

The entry of Afrikaner capital was effected by favourable treatment by the state through its institutional position and in its role as a major consumer in the market through, for example, shifting state bank accounts to Afrikaner financial institutions and awarding lucrative coal supply contracts for power stations to Afrikaner-owned mines, chapter 4. The rise of Afrikaner capital was a slow process, the breakthrough into gold mining only occurring with the takeover of the General Mining Corporation by Fedvolks in 1964 with the assistance of the Anglo American Corporation. The

objective of empowering large-scale Afrikaner capital contradicted any commitment to the promotion of competition under the Regulation of Monopolistic Conditions Act No.24 of 1955. Evidence of investigations under the 1955 act indicates that monopoly was justified if it contributed to overall national productive efficiency. However, what constituted the "public" interest was never clearly defined.[10]

The rapid concentration of ownership that took place in the 1960s and early 1970s and the uneven effects that both gold and oil price rises had on the economy, particularly the manner in which cash rich fractions of capital like Anglo American and GFSA threatened the takeover of assets of other fractions of capital that had little interest in gold mining, led to the appointment of a Commission of Inquiry into the 1955 Act. The Commission gathered considerable evidence of concentration in sector after sector showing extensive oligopolistic conditions. Oligopoly was found to have been exacerbated by protectionist barriers, small market size, distance between centres and historical factors which have influenced the pattern of industrialisation. The Commission recommended that changes were required to speed up the process of investigation which conflicted with other Board of Trade and Industry (BTI) activities and priorities. Apparently, proper investigation under the Act in order to determine whether, for example, a merger was in the "public" interest, was hampered by the lack of qualified staff and resources.[11] A major criticism was the fact the Act applied only after abuse had occurred, that since it was not pre-emptive,it was unable to deal effectively with the rising spate of mergers.

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10 See Tregenna-Piggott (1980, p.29).
11 Competition Board Annual Report, 1980.

This report led to the 1955 Act being superceded by the Maintenance and Promotion of Competition Act No.96 of 1979, under which, the Competition Board (CB) was set up and empowered to investigate and advise the Minister of Industry, Commerce and Tourism on the existence of restrictive practices, on proposed or completed acquisitions and to interpret whether such practices were or were not in the "public" interest.[12]

If monopolistic conditions were found to be against the public interest, the Board had the power to negotiate with the infringing parties to resolve the specific problem. If the latter did not comply, legislation could be enacted to prohibit the practice. In addition the CB had specific responsibilities to monitor ownership concentration continuously which served to guide investigations into acquisitions or mergers and to publish guidelines on policy on acquisitions. These guidelines encouraged consultation with the Board prior to making acquisitions through the granting of immunity against any subsequent dissolution through legislation. Maximum penalties for contravention of clauses issued under the Act were R100,000 and/or 5 years imprisonment. To date, no such penalties have ever been imposed.

The most important aspect of the 1979 legislation (like its predecessor) is that it was an enabling measure. It did not contain any prohibitions, could not be contravened and merely established guidelines for viewing monopoly issues. The objectives of the 1979 Act were clearly stated;

> This is not anti-monopolistic legislation. It is just a bill to regulate monopolistic conditions and it appears very clearly from this, that even though a monopoly exists and even though combines exist,

12 See Competition Board (1981, p.3) for a detailed definition of restrictive practices. See Competition Board (1981, pp.7-26) regarding acquisitions.

> they can still be justified in South Africa if they do not have a deleterious effect on the public.[13]

The Act did not address the extent of concentration of ownership nor market share as an issue. Monopoly was not regarded as a problem in itself, only when it affected the "public's interest" as interpreted by the CB and finally judged by the Minister. Furthermore, where mergers were concerned, the focus was to inhibit future mergers to prevent concentration, while dismemberment of existing concentrations was regarded as retarding growth and as too drastic or difficult a task.[14]

In practice, however, the Board's investigations have focused on relatively minor sectors as table 2.13 shows below and, furthermore, no concept of linkage between economic sectors appears to have been considered until after 1986. In the case of alcoholic beverages, the Board appeared to avoid confronting South African Breweries (SAB) who had consolidated 100% control over the beer market by taking over its rival Intercontinental Breweries under an industry restructuring directive by the BTI in 1979.

> SAB's acquisition...constituted a restriction on competition in the beer industry, but...little could be done to restore the slight degree of competition that had existed...[15]

A minority report criticised the Board's neglect of this and its decision instead to condemn the wine industry, 85% of which was controlled by a company jointly-owned by Rembrandt and the KWV vine growers co-operative.

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13 Minister of Economic Affairs, when introducing the Draft Bill of the 1977 Act, Hansard, 28 February 1977, Page 1824. Quoted in Tregenna-Piggott (1980).

14 See Fourie (1987).

15 Competition Board Annual Report, 1982.

TABLE 2.13 - COMPETITION BOARD ACTIVITIES, 1980-1990

INDUSTRY INVESTIGATED	REPORT NO.	DATE	TYPE
PHARMACEUTICAL PRODUCTS	BTI 1884(M),	1980	
MOTOR VEHICLE PARTS	BTI 1929(M),	1980	
BUILDING INDUSTRY(SANITORY/HARDWARE)	1,	1980	RP
POULTRY INDUSTRY	2,	1981	RP
FERTILISER	3,	1981	SD
DISCRIMINATION IN PRICING & CONDITIONS OF SALE	4,	1981	D
ASSOCIATION OF S.A. TRAVEL AGENTS	5,	1982	ACT
ELECTRICAL CONTRACTORS ASSOCIATION	6,	1981	ACT
INTERFLORA	7,	1982	RP
SOFT DRINKS INDUSTRY	8,	1982	RP
SUPPLY & DISTRIBUTION OF EXPLOSIVES	9,	1982	RP
SUPPLY & DISTRIBUTION OF ALCOHOLIC BEVERAGES	10,	1982	RP
SUPPLY & DISTRIBUTION OF FERROUS SCRAP METAL	11,	1983	RP
SUPPLY & DISTRIBUTION OF COAL	12,	1983	RP
SUPPLY & DISTRIBUTION OF ANTHRACITE	13,	1983	RP
ACQUISITIONS BY SCAW METALS	14,	1983	ACQ
COLLUSION ON PRICES & CONDITIONS	15,	1985	
ACQUISITION BY ARGUS	16,	1986	ACQ
REAL ESTATE MULTI LISTING SERVICES (PTY)LTD	17,	1987	RP
ACQUISITION BY NEBANK GROUP	18,	1987	ACQ
ECONOMIC CONCENTRATION IN SAWMILLING INDUSTRY	19,	1987	ACT
POSSIBLE ACQUISITION OF GFSA BY ANGLO AMERICAN	20,	1989	ACQ
ACQUISITIONS IN THE BAKING INDUSTRY	21,	1989	ACQ
ACQUISITIONS IN THE ANIMAL FEED INDUSTRY	23,	1989	ACQ
ACQUISITIONS IN THE STATIONARY INDUSTRY	24,	1989	ACQ

POST 1986 DEREGULATION ACTIVITIES

TRADE REGULATION : LICENCING & TRADING HOURS
TAXI LICENCING
LEGISLATION AFFECTING BLACK TRADERS
FOOD HANDLING REGULATION
DEREGULATION OF INDUSTRIAL PARKS
PROFESSIONAL ASSOCIATIONS
REGULATION AT LOCAL GOVT.LEVEL

Source: Competition Board Annual Reports, 1980-1990, Competition Board, Published Investigations No. 1-24, 1980-1990, Government Printer, Pretoria.

(1)Investigation Type:
RP = Restrictive Practice
ACT = Activities
ACQ = Acquisition
D = Discrimination
SD = Supply & Distribution

In the case of explosives, restrictive practices were found and the CB was instructed by the minister to negotiate rectification. This decision assisted Sasol's entry into the explosives market. In the case of coal, the Board regarded the excessive regulations governing the industry to be contrary to the public interest. However, coal production, distribution and export continued to be monopolised by conglomerate subsidiaries.

Between 1980 and 1986, political and economic crises deepened. Large capital outflows and a collapsing currency forced the South African state to declare a moratorium on debt repayments in 1985. The embracing of deregulation and privatisation policies prompteD the Competition Board to shift its attention to such investigations after 1986, (table 2.13).[16]

In 1986, an amendment to the 1979 Act was passed (Act No.5 of 1986) which had the following implications;

a)It extended Competition Board powers to take action against an "existing concentration of economic power". Previously, it could only act against new concentrations.
b)Powers were extended to cover financial institutions, previously limited by Section 16 of the Act.
c)It removed exemptions covering agricultural co-operatives and control boards (Section 2(i)(c)). Up to 1990, no action had been taken against these sectors, although an investigation into the Eastern Transvaal Cooperative (OTK) was instituted in July 1989.
d)It formally introduced issues of deregulation and privatisation into the activities of the Board, which subsequently played an increased advisory role in formulating state policy in this regard.

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16 Deregulation also had the effect of empowering capital. Under the Temporary Removal of Restriction on Economic Activity Act, 87 f 1986, the State President could exempt entrepreneurs from a host of national and local ordinances including safety requirements "if it unduly impedes economic development or competition or the creation of job opportunities". Competition Board Annual Report, 1987, p.11.

e)The Boards composition was increased through Reserve Bank and Agricultural Ministry appointees to include expertise on agricultural and financial matters.

A changing relationship between capital and the state is reflected in the extension of the scope of the Competition Board to cover existing concentrations of private power. The financial crisis at this time was over-riding and perhaps for this reason, the CB were instructed by the Minister in 1986 to abandon their investigation into structural linkages between businesses through interlocking directorates and cross-holdings and focus instead on the concentration in the financial sector. The Board justified this investigation as follows;

> ..because of the close links which financial institutions in particular had with the major conglomerates in the country the issue of economic concentration had to be addressed on a broader basis. In this respect the investigation proved to be very fruitful and has provided the Board with a sound overall picture of the considerable diversity and extent of conglomerate activity in South Africa.[17]

Here the result of previous complacency is clearly apparent, perhaps arising from the consensual approach that the Board had taken since 1979. It is a reflection on the activities and role of the Competition Board, its predecessors and other state agencies that between 1955 and 1988, such an important study was never carried out. Ovendon and Cole (1989) have pointed out that at the time of the declaration of a moratorium, the extent of debt exposure was not known. Capital flight played an important part in the decision to focus on the financial sector. Ovendon and Cole (1989, pp.123-124) report that;

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17 Competition Board Annual Report, 1988, p.9.

> ...in...December 1988 a working group was set up at the request of the Minister of Finance to examine various completed foreign exchange transactions in response to information that had come to light suggesting new methods of avoidance....the South African Reserve Bank..was taking a number of measures to improve exchange control methods of enforcement (by) a Senior Deputy Governor of the bank ...(assuming)...specific responsibility of co-ordinating the exchange control and banking supervision departments of the bank....The exchange control department was to take outside advice from accountants and other government departments in the search for methods for detecting and preventing over-invoicing of imports, and other fraudulent methods of avoiding exchange control of capital exports.

Since 1986, there appears to be a new thrust in the approach of the CB. Firstly, the focus on agricultural co-operatives also serves a political purpose in the increasing threat that the Conservative Party and other splinter groups pose to the National Party. Secondly, the support for privatisation falls more within concepts of perfect competition and neo-liberalism with associated minimum state involvement, echoing the perspectives of the conglomerates who are likely to be beneficiaries of privatisation and deregulation policies.

In summary, although anti-monopoly legislation has been in existence since 1955, it has never been exercised to the detriment of large-scale capital. Rather, it was initially used as a lever to force the then dominant English capital fractions to accommodate Afrikaner enterprises. By the mid-1970s, growing interpenetration between English and Afrikaner capital led to a review of competition policy, but the emergence of the Competition

Board did not have any effect on the process of ownership concentration around the MEC core. Since 1986, the crisis of the NP appears to have shifted the position of the Board towards more of a perfect competition perspective, providing it with greater powers and scope. However, the Board has yet to act against the high levels of concentration across and between all the sectors of the economy that this chapter has described.

CONCLUSION

In conclusion, six "axes" of private capital dominate the South African economy. Control has initially extended as an articulation of mining activities into MEC core sectors. This, in turn, has broadened to cover all other productive sectors as well as the financial sector, the control of which serves to reinforce conglomerate power.

The growth of the MEC core sectors and the increasing interpenetration between fractions of large-scale capital, which were formerly characterised as "English" or "Afrikaner" capital, has been associated with the state's direct role in ownership of sections of the productive sector. State investments have largely contributed directly and indirectly to enlarging the MEC core. In regulating the process of oligopolisation of the economy, the MEC, as a system of accumulation has been lubricated through, for example, the effect that such regulation had on the empowering of Afrikaner capital. The overall impact that this has had on broader industrial development will be explored below.

CHAPTER THREE

THE POLITICAL ECONOMY OF INDUSTRIALISATION IN SOUTH AFRICA DURING THE INTER-WAR PERIOD

INTRODUCTION

Both the political economy and the historiography of apartheid have gone through a number of stages.[1] The major divide is undoubtedly between the liberal and revisionist traditions. As has been pointed out all too frequently, the distance between these two positions is enormous both in methodology and in conclusion, but they also have a common thread in counterposing the relative priority of race and class against the performance of the economy. In this respect, they are like two sides of a well-worn coin which drives the better out of circulation - at least until it is no longer acceptable currency. As Posel (1983, p.56) observes:

> When defined in antithesis to this liberal stance, revisionism amounts to a simple reversal of the purportedly liberal priorities: class now has primacy over race, and segregation and apartheid are seen as functional, rather than dysfunctional, to the development of South African capitalism.

The most apt testimony, possibly testament, to this observation is Lipton's (1986) culminating contribution to the liberal tradition which falls more accurately into the role of synthesis between the two schools in combining an examination of class/strata interests with the (ultimate) efficacy and triumph of market forces.

Whatever its limitations, the class-race debate was inevitably dependent for its origins on the specificity of South African society. This has not, however, been the

[1] Exploring South Africa's own historiography has proved an extremely popular pastime. See for example, Murray (1982 and 1988), Morris (1987), Saunders (1988a and b), Bozzoli and Delius (1990), Cell (1982), Smith (1988), Wright (1977), Mabin (1986), Marks and Rathbone (1982) and Marks (1986).

only influence on intellectual developments. New approaches and objects of analysis have followed both in response to the unfolding of internal events and according to the intellectual fashions of the outside world. Thus, revisionism in different ways appropriated the insights of the various strands of the structural Marxism of the 1960s onwards. It has given way to a social history, which has drawn its inspiration from the work of E.P. Thompson. In this literature rural struggles figure prominently and there is considerable antipathy to reductionism, functionalism, structuralism and many other -isms. In its place is offered rich empirical detail, and an emphasis on the many-sided making of history both in terms of the different aspects of, and participants in, struggle. But there is precious little explicit theory.

More recently, in response to the gathering crisis of the apartheid regime, much attention has been shifted to explaining this turn of events - ironically, possibly a greater problem for the triumphant revisionists than for the predominantly vanquished liberals given their respective positions on the functionality of apartheid for South African capitalism. Neatly illustrating the point of the dual dependence of South African intellectual development on internal events and external theory, Gelb's (1991) collection marries regulation theory, and its notions of modes, social structures and regimes of accumulation, with an explanation of the crisis of the South African economy - as the collapse of "racist Fordism".[2]

An analytical stance organised around explaining the crisis has, however, already been rendered redundant to some extent by the pace of internal events. It is too backward-looking. Now there is less emphasis upon the causes of the current crisis and more upon the shape of

[2] Regulation theory originated in the Marxist work of Aglietta (1979). It has since become increasingly eclectic and removed from Marxism. For a critique, see Mavroudeas (1990) and Brenner and Glick (1991).

future economic policy and developments in a post-apartheid society. It is no longer enough to look back and see how what was favourable to accumulation came to be unfavourable, it is also necessary to see how conditions can be made conducive to economic growth once again, albeit in serving very different needs and constituencies. As it were, policy considerations, rather than class struggle or laws of development, have become the leading edge on the analytical cutting tools.

These opening remarks are not intended as a cynical dismissal of past practices in which the rigour and validity of academic endeavour is perceived to be injuriously influenced by current events and intellectual fashions. Indeed, the substance of this chapter does itself consciously fall into this pattern. Its concern is predominantly with the debate over inter-war economic policy and development and, in particular, the relationship between economic and political power. It is influenced by concern over the same issues for the coming period but this will not be made explicit except by way of concluding remarks.

Nevertheless it is worthwhile making explicit the intellectual origins of this contribution. Previously, debate over the inter-war years has been based on an analytical and policy milieu of dependency theory and import-substituting-industrialisation. Accordingly, for a developing and potentially industrialising economy, the main focus has tended to fall on the issues of markets and protection at the policy level and on the issue of class interests over these at the analytical level. Today, certainly in the light of the success of the Asian NICs, it has been found that the range of policies involved in industrialisation (and hence the role of the state) is much broader, with trade policy as such not

necessarily foremost;[3] and, nor is this simply a matter of discovering the right policies and adopting them. The capacity of, and pressures upon, the state to do so depends upon its relations to class interests and economic structures.[4]

In this light, the analytical position adopted in this paper is quite straightforward and far from original, although its implications are possibly stretched further than before. It accepts that mining and other closely-related capital held, and continue to hold, economic power in South Africa. However, the assertion of this economic power politically was eroded in the inter-war period as the attempt was made by the state to support an indigenous, predominantly Afrikaner, capital (with its advantage of political support from the white working class). This success of the goal of creating a national capital was dependent upon collaboration as well conflict with mining capital, given the surplus generated by the latter. As a contemporary put it, Pearsall (1937, p.422):[5]

> It therefore seems likely that secondary industry will be in a better position to meet the fluctuations of trade, provided always that no sudden set-back to gold-mining, on which so much of our prosperity depends, should occur.

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3 An astonishing indication of the continuing identification of industrial with trade policy in South Africa is to be found in the IDC's recent report on protection policy, IDC (1990, p.1): "In this report the terms "trade policy" and "industrial policy" are used synonymously and interchangeably."

4 These issues are discussed in the context of South Korea in Fine (1992b).

5 See also Busschau (1945, pp.220-1):

> The fact that the output of "Manufacturing" is more valuable and has probably increased more rapidly in volume than the outputs for "Mining" and "Agriculture" also does not prove that "Manufacturing" is the prime generator of income, since, as already explained, much of the output of both manufacturing and agriculture depends on the needs of the chief consumer, the mining industry ... one cannot escape the conclusion that the primary impulse towards a greater national income in the immediate past has come, and in the future will have to come, from increased mining activity, particularly that of gold mining.

The more the surplus that could be generated by mining, the more was potentially available for subsidising national capital. Consequently, the inter-war development of South African capital is best seen as one in which the strength of mining capital dictated the boundaries within which national capital could be economically, and hence politically, supported. There were then limits on the economic policies of the state, whatever its derived political objectives, because of its economic dependence on mining capital. By the same token, the possible accumulation strategies of mining capital were circumscribed by its relation to the exercise of state power.

In the next section, these issues are explored further by reference to the debate over hegemony in the inter-war period. It is suggested that this debate is limited by its being too much oriented around zero-sum pay-offs, seeking to read off the exercise of political power by reference to the redistributional advantages bestowed by the state's economic policies. Instead, it is necessary to look more closely at the complex relation between economic and political power at a greater level of detail and according to the particular issues concerned.

Section 2 attempts to do this by reference to the development of the inter-war economy, examining broad economic aggregates as well as specific industrial sub-sectors. A focus is placed on trade policy and the role of state enterprises. It is less concerned with exploring the motives, consequences and beneficiaries of such interventions than in revealing the limited extent to which coherent industrial policy progressed beyond them. This reflected the uneasy relation between mining capital and the state, which essentially foreclosed the option of an industrialisation strategy based on diversification out of the economic base provided by mining.

1. HEGEMONY OR CONFLICT AND COMPROMISE

Central to debate over the inter-war South African economy is the contribution of Davies et al (1976).[6] Methodologically, they adopted the approach of Poulantzas for which there is a structured tier in the exercise of power and in which the various fractions of the exploiting classes (identified at the economic level) jockey for advantage politically through the formation of a power bloc to control the state. Thus, there can be shifts in the relative economic positions of different sections of capital as well as in their political influence. Necessarily, these structures and their associated dynamics are dialectically related to one another and to intra- and inter-class conflict.[7]

For Davies et al the primary division is between national and imperial capital, with a secondary division within national capital between agriculture and manufacturing, both of which are closely identified with Afrikaners. Imperial, foreign or English capital is primarily identified with mining. The election of the Pact Government in 1924, an alliance of the white Labour Party and the Nationalist Party, signals for them the loss of hegemony by imperial capital to national capital. Consequently, economic policy in the inter-war years, despite the formation of the Fusion Government in 1933, is seen as representative of the interests of national capital - particularly in support for agriculture by a variety of measures, protection of domestic industry (and agriculture), the creation of state corporations, especially in steel (ISCOR) and electricity (ESCOM), and the heavy taxation of (gold) mining to fund these policies. As a corollary, political support depended upon incorporation of the white working class, partly by more

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6 This article constitutes a synthesis of the four authors' PhD theses, Morris (1979) on the development of capitalist agriculture, Davies (1979) on the white working class, O'Meara (1983) on the Afrikaner bourgeoisie, and Kaplan (1977) on class fractions and the economic policies of the state.

7 For a sympathetic account of Poulantzas, see Jessop (1985).

or less temporary schemes of employment relief for poor whites and job reservation more generally. This is seen, however, as secondary and contingent upon the level of white working class economic and political pressure.

This approach, and the specific stance within it, has been the subject of much criticism. Methodologically, however well it is an application of Poulantzas' theory,[8] the net result is simply to couch interest group analysis at the economic and political levels in the more obscure language of hegemony, power bloc, etc, in which changes of government and/or policy are read off in accordance with a corresponding judgement of who wins and who loses. There is a notable absence of the analysis of dynamics and contradiction in practice. In particular, there is a peculiar inversion of Marx's method, in which the economy is read off through the policies of the state (although this is always a danger within the Poulantzas method of relative autonomy, displaced contradictions and the formation and hegemony of power blocs). As Freund (1989, p.94-5) succinctly puts it, the problem lies "in trying to understand material change by an unwandering gaze on the state rather than the actual economy".

There are also criticisms to be made at the level of detail. First, support for agriculture was by no means initiated in the inter-war period; it reflected, then, more a continuity of policy even if increasingly favourable to white farmers. As Horwitz (1967, p.129) reports:

> Between 1910 and 1935, eighty-seven bills relating to the land were executed by Parliament in a Parliament in which farmer-members were a high proportion in all political parties.

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8 Bozzoli (1978), Clarke (1978) and Innes and Plaut (1978) all point to the treatment of hegemony in Davies et al primarily as a relationship within the capitalist class, rather than as one of dominance over the exploited classes. For a response, see Kaplan (1979).

Second, there are complex issues concerning the boundaries of the various fractions of capital, with foreign capital involved in many non-mining activities, including agriculture and manufacturing.[9] Freund (1989, p.81) refers to diversification from mining into repair and maintenance and other engineering. This contrasts with the Cape garment industry, thereby signifying a lack of integration and homogeneity in secondary industry whether sectorally, politically or regionally.

Third, some, most notably Yudelman (1983), would take 1933 and not 1924 as a turning point in policy, either rejecting the view that the Pact Government represented a victory for white miners or because the later date witnessed a stimulus to manufacturing out of the revenue and demand generated by the gold industry as the gold price rose in the thirties. The point, however, is less to deny or to exaggerate the significance of political change as to situate it in a fuller and more complex analysis of economic interests and relations (of dependence as much as of conflict).

Fourth, and relatedly, the approach of Davies et al may be considered too historically delimited. It has primarily been motivated by a wish to anticipate and explain the subsequent period of classic apartheid. Consequently, continuities with the past concerning the conflict and compromise between fractions of capital are implicitly reduced to the presumption that the Boer War implied an unambiguous hegemony for foreign capital prior to its overthrow in the inter-war period. Yet, as sharply demonstrated by Marks and Trapido (1979), even the reconstruction period after the War involved continuing compromise between the interests of different capitals, even if the primary objective of the state was to guarantee conditions favourable to the pursuance of

9 See Bozzoli (1978) and (1981), Fransman and Davies (1977), Bienefeld and Innes (1976) and Kubicek (1991).

mining (which it never subsequently threatened).[10] Finally, the taxation of goldmining, whether directly or indirectly through differentially disadvantageous railway charges and protection, is indicative of dependence on, not dominance over, mining especially after the rise in gold prices when heavy profits were to be made and in which the state would surely be expected to share.[11] As Kaplan's (1977, p.157) own account of the excess profits tax on the gold mines in the 1930s reveals, there was give-and-take in the amount appropriated by the state. In response to Chamber of Mines and other protests:

> Duncan, as Acting Minister of Finance, granted a number of concessions. The most important of these were to place definite limits on the tax yields for the next five years - £6 million in the first year, £7.4 million in the second year, and for the three subsequent years a maximum of 50% of the excess profits.

With limited exceptions, it is not the intention here to pass judgement on these issues. To a large degree, they suffer from being situated in too simple an approach in which the various interests involved, capitalists and white labourers, gain or lose at one another's expense. The analysis is primarily redistributional with a greater or lesser weight being given to the motives of, pressures upon, and power of government. Given its political

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10 For somewhat later, Gelb's (1989) analysis of the creation of the South African Reserve Bank in 1921 is obscured rather than illuminated by the idea that it simply forms part of the shift in power from foreign to indigenous capital. He is, however, sufficiently sensitive to the empirical details of what occurred to qualify, possibly to undermine, the historiography involved, p.65, emphasis added:

> This contradiction (over the control of monetary policy), it would seem, is indicative of the complexity and the duration of the transition in South Africa during the inter-war period from imperialist domination to peripheral national capitalism.

For analysis of the preceding period, where emphasis is placed on the shifting realities of the world financial system (within which mining capital and the City do not represent a homogeneous foreign capital), see Ally (1990) and (1991).

11 See Fransman and Davies (1977).

complexion, this essentially reduces to the extent to which the exercise of political power on behalf of national capital (and possibly white labour) is both genuine and able to overcome the economic power of foreign, mining capital.

Such a general framework for assessing policy is necessarily insensitive to the differences in the material organisation and development of particular economic sectors, and these differences will determine the scope for policy interventions by government. To give an extreme example, the policy of remaining on the gold standard, as an act of independence from Britain after it had abandoned gold in 1931, proved so disastrous that it had to be dropped even though this boosted gold mining profitability in particular. Indeed, with the pay limit system to ensure the full working of poorer ores when the gold price was higher, it can be argued that policy was directed to prolonging mining capital, rather than allowing the maximisation of immediate returns, because of its continuing importance in sustaining other government objectives.

This all takes us to the point of recognising that the various fractions of capital were highly interdependent and not just in conflict, not least because the surplus to be obtained from mining was essential to the support of other indigenous economic activity. One of the results of focusing on the politics of power blocs is that differences between fractions of capital tend to be exaggerated at the expense of recognising a common interest in relation to the exploited classes which, of necessity, sets the

structural limits within which capitalists can compete.[12] To move beyond this analytical observation, however, and uncover the relationship between economic and political factors, requires specific studies. These have been notably absent in the literature, especially for manufacturing. For all the discussion of hegemony of manufacturing (and agriculture) over mining in the inter-war period, industry has hardly been investigated and, when it has, this has usually been as background for some other purpose such as the history of a trade union.

Perhaps the one area of "economic" policy in which most analytical and empirical advance has been made, and for which many of the above criticisms are less applicable is for labour control - not least because it has been explored both in terms of the practical needs of different sections of capital as well as politically and ideologically. Consequently, a much more complex and complete picture has emerged, in which the conflicts of interest between capitals over access to black labour has been set against a common interest. Thus, Lacey (1981, pp.3-4) puts it as:[13]

> How the Hertzog regime handled the issues between 1924 and 1932, and how finally the dominant classes in the rival capitalist sectors determined to sink their differences and hammer out a policy which enabled them to tackle the one overriding issue: how best to super-exploit all African workers in the

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12 Clarke (1978, p.55) makes a similar point, whilst both oversimplifying and constructing too sharp a dichotomy between state and capital: "Normally the relations between capitals, and so between departments, are regulated by competition and the ability of the state to intervene in these relations without disrupting accumulation is limited. There are normally severe limits on the ability of the state to intervene to redirect surplus value. These limits are not given, as the fractionalists (Davies et al) would have us believe, by the total available surplus value and the relative political strength of the various parties involved in political conflict. They are rather given by the role of surplus value in the expanded reproduction of the capitalist mode of production."

13 Following the work of Wolpe (1972), the issue of labour control has been treated with increasing sophistication, recognising differentiation within the black workforce, as in Hindson (1987). See also Dubow (1989) and Posel's (1991) discussion of the inter-war period.

interest of capitalist profitability and the national economy as a whole.

From the gold-maize alliance of the turn of the century, a compromise was reached in the inter-war period which privileged agriculture's access to domestic supplies of black labour by simultaneously promoting the mines' access to foreign migrant labour.[14]

What follows does not remedy, for other areas of application, our collective analytical deficiencies - which are, in part, a reflection of the very weakness of manufacturing and the even greater weakness of industrial policy. Rather it seeks less to identify the conflicts between various fractions of capital as to explore how their mutual interactions determined the policy options that were, or were not, available. More specifically, our narratives below are intended to illustrate a number of overlapping themes; the preference for indigenous over imperial capital, but dependence upon the latter especially because of the weight of mining in the economy (as a source of revenue and as a structural determinant for industrialisation); the need to disaggregate economic activity to unravel the interplay of economic and political forces; but the underlying failure to develop coherent and comprehensive industrial policies because of the disjuncture between economic and political power, leading to a corresponding fragmentation of policymaking.

[14] On the gold-maize alliance, see Trapido (1971), and Morrell (1988) for its dissolution in the inter-war period. See Crush et al (1991) for discussion of the mines' foreign migrant labour empire.

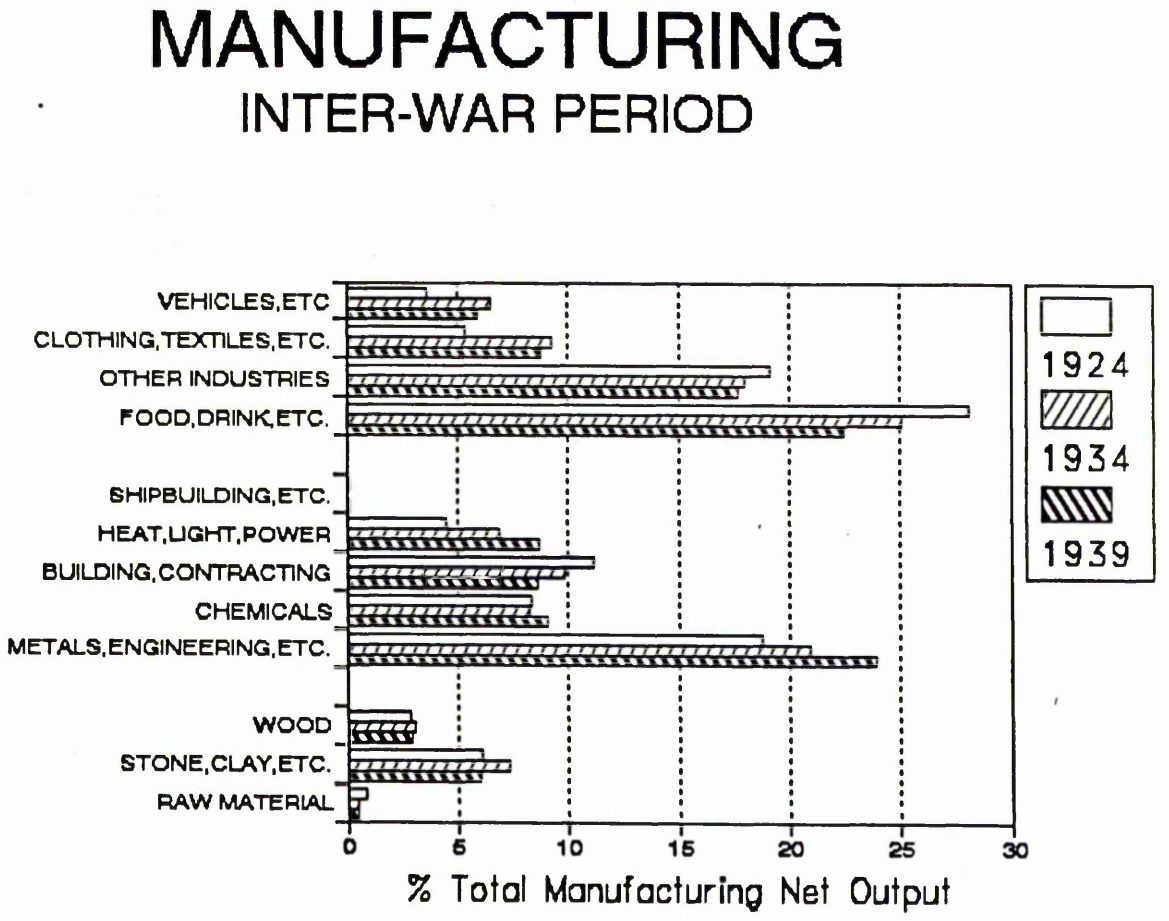
2. INDUSTRIAL INTERVENTION

The inter-war years are acknowledged as the period when industrial policy was first overtly and extensively implemented. It appears to have met with some success in bringing about industrialisation. However, it is important to clarify what "industrialisation" is perceived to be. At an aggregate level, commentators have interpreted industrialisation in terms of the relative shifts between manufacturing, agriculture and mining activities.

From contributing 9.8% to national income in 1918, private manufacturing grew to 17.7% in 1939. Mining fluctuated between a low of 15.2% in 1922 and a high of 23.8% in 1933 (after the gold standard was abandoned). Agriculture clearly declined in relative importance; its contribution to national income fell from 20.2% in 1918 to 12.2% by 1939.

However, it is important not to read off the rhythm of economic and political power and the impact of policy choices from such aggregate data. It is also necessary to recognise what policy options were not adopted. The purpose of this section is to highlight the absence of coherent state policy both for broad aggregate sectors of the economy and for certain sub-sectors of manufacturing. It supports the conclusion that the disjuncture between economic and political power in the inter-war period gave rise to different outcomes according to the incidence of compromise and conflict sector by sector.

FIGURE 3.1 - INTER-WAR SECTORAL ECONOMIC ACTIVITY



Source: Union Statistics for Fifty Years (1960,s-2).

2.1 POLICIES TOWARDS AGRICULTURE

In the case of agriculture, the central authority of the state was unable to provide a clear lead through its own policy - it resorted to devolving responsibility and decision making powers to the various agricultural control boards that were set up at this time. This reveals another deficiency in the literature on the economy of the inter-war period, namely that regional differences and class differentiation within the ruling party in government have not been adequately addressed - the state is often interpreted as a relatively monolithic central authority, more plausible for its relations to mining, less so for Afrikaner capital.

For, although agriculture was protected, state support was neither fully centrally controlled nor implemented on behalf of a readily identifiable and uniform agricultural interest. The process of agricultural policy formulation is described by Richards (1935, p.397) as:

> 1. The passing of an enabling act which permits the Minister to make regulations for the control of a particular agricultural industry or product;
> 2. In pursuance of this policy, the Minister sets up boards of Control composed largely of representatives of the particular agricultural industry whose interests it is desired to protect, with wide and arbitrary powers affecting all phases of the industry, and incidentally the interests of the consumer.
> 3. There is a third method whereby the Minister delegates his powers to existing organisations but with increased jurisdiction, e.g. in the case of the central Co-operative for Maize in 1933, and the K.W.V. for the Wine Industry.

Protection after 1925 has often been seen as favourable to agriculture anNd manufacturing at the expense of mining capital that had to foot the bill in terms of higher input prices. The impact of protection, however, is not quite so simple; along with other factors in play, effective rates of protection and their ultimate incidence do not appear to have been assessed, either in policymaking or in retrospective assessment. Not least is the issue of whether conditions were conducive to promoting infant industries or to feather-bedding inefficiencies, or whether policy was more likely to lead to one or the other.

Specifically, manufacturing sectors dependent upon agricultural inputs faced higher costs, reflecting the absence of a strategy favouring the development of linkages between agriculture and manufacturing.[15] The opposite appears to have been the case, as the Board of Trade acknowledged:[16]

> Confectionery manufacturers must buy highly protected sugar, glucose made from maize and milk powder at relatively high prices and that agricultural protection must be followed by industrial protection, if local factories are to use South African raw materials.

Horwitz points to a further factor undermining the development of food processing industries:

> What the Board of Trade and Industries did not elaborate was that the dumping of many of these agricultural raw materials under forced-export policies enabled foreign manufacturers to obtain their raw materials at below cost to the even

15 For details from a political perspective, see O'Meara (1983).
16 Horwitz (1967, pp.248-9), citing BTI Report No. 282.

further disadvantage of their South African competitors.

Another example of the lack of coherent policy towards agriculture and industry is presented by Alexander (1935). He refutes arguments of the day excusing the failure to penetrate dairy export markets. Citing the cases of New Zealand and Denmark, which had successfully overcome similar debilities such as soil infertility, uncertain rainfall, vast travelling distances, odours in cream and lack of monetary incentives to dairy-farms, Alexander observes that, p.359:

> The reasons for the comparative failure of agriculture in the Union ... is not the natural conditions of the country which are so largely to blame as the incompetence of past Governments, ever since Union, and, largely arising from this, the inefficient methods of the majority of farmers.

While most observers have recognised that the thrust of inter-war state policy was to favour domestic industry and the agricultural sector, the resources allocated to the latter appear to outweigh the commitment to developing the former. For example, the cost of agricultural subsidies in 1933 alone are estimated at £7.5m,[17] more than twice the £3.5m that was spent on Iscor between 1929 and 1933. If the establishment of a domestic iron and steel industry proved possible with such support, surely much more could have been done for food processing? That it was not, as Richards observes, reflects the devolution of responsibility to fragmented interests. The state's representation of small-scale Afrikaner capital, whether agricultural or industrial, did not preclude a concerted policy for the development

[17] Richards (1935, p.365). It is evident that other forms of subsidy, such as transport rates, also favoured agriculture relatively.

of food processing and marketing, but it could not be pushed through by the state centrally. Consequently, the relative absence of political representation of mining capital weakened industrial policy through its inability to diversify from mining. And, even where mining capital had no direct role to play (other than in paying taxes to support subsidies, etc.), the state's room for manoeuvre in the policies that it could adopt were contingent upon the economic and political structures of indigenous Afrikaner capital - the more so because of the political weakness of the economically dominant form of capital.[18]

Despite this disjuncture between economic and political power, the history of the wine industry illustrates how, through the devolving of price fixing power to regionally (Cape) based interests in 1924, it was possible for small-scale Afrikaner capital to be accumulated through the concentration and centralisation of the resources of a relatively small sector of the economy. The strength of its political lobby is evident in the numerous Commissions of Inquiry and BTI Reports from as early as 1934, whose consistent recommendations for the economic disempowerment of the vintners represented by the KWV, were never implemented, Fridjon et al (1986). It was precisely from these and other similar roots that the Rembrandt, Sanlam and Old Mutual conglomerates grew into economic rivals to the offshoots of imperial capital. As Fridjon et al (1986, p.62) observe:

> All groupings of farmers in South Africa are politically powerful, but the most powerful of all are the 6,000 grape farmers. There are many reasons for their power. They ... have always supported the Nationalist Party with votes, money and ... are heavily represented in Parliament as Cape

[18] Consequently, the economic and social histories of the food and other consumer goods industries are different from one another, each depending upon regional specificities and their associated political and economic factors, Cape wine as opposed to Natal sugar, the maize triangle, etc.

> Nationalists ... are extremely well and cohesively organised, and, not least, they enjoy a statutory framework that is extraordinarily helpful to their interests.

From a critical, free market perspective, they argue that the industry was held back from greater efficiency and dynamism. By the criterion of creating relatively large-scale Afrikaner capital, however, the KWV can be considered a success in forging a linkage between agriculture and food processing. Experience across the food and beverage industry more generally is much more mixed. As a sector, it stands out during the inter-war period, accounting for 37.6% of manufacturing's gross output in 1924. By 1939, this had declined to 26.6%. Nattrass (1988) attempts to explain this decline in part as an outcome of the operation of Engels Law, that a diminishing proportion of (mainly) white incomes would be expected to be spent on food. But such demand-side explanations, essentially tautologous in nature, are insensitive to differences across sub-sectors and to the potential availability of export markets.

Smith (1945) has addressed the supply-side, pointing to a significant degree of concentration within the food and beverage sector of manufacturing. Between 1940-42, 3.5% of all firms within this sector produced more than 50% of total output. This figure, however, conceals more than it reveals. Consider the crushing and processing of sugar cane, for example. By 1933, sugar processing accounted for about 20% of the food sector's output. Its growth during the inter-war period was dramatic, from 82,000 tons in 1919 to 500,000 tons in 1939, and it also had a disproportionate impact on the spatial pattern of development in South Africa. Most of its associated activities were concentrated in Natal, a province dominated by a mixture of imperial and domestic (English) capital. Sugar was not cultivated in the Eastern

Transvaal until much later, and that development was associated more with the growth of the Rembrandt Afrikaner conglomerate.

TABLE 3.1 - PRODUCTION CONCENTRATION IN MANUFACTURING, 1940-42

	% Firms Producing 50% of total output
Food & Drink	3.5
Vehicles	0.4
Metal & Engineering	5.0
Clothing & Textiles	3.9
Building	6.4
Stone & Clay	3.1
Paper & Printing	5.0
Wood	6.4
Furniture	8.0
Leather	6.0
Chemicals	4.8
Heat, Light & Power	3.5
Surgical Instruments & Jewellery	4.8
Raw Materials (1)	6.5
Other	3.3

Source: Smith (1945).

(1) Raw Materials include Tallow Rendering, Bone Milling, Fellmongering, Wool Scouring, Chaff-cutting, Corn Crushing, Cotton Ginning, Wattle Bark Grinding.

Sugar processing is just one of several activities within food processing. A further 30% of food output in 1933 consisted of the production of Tobacco, Bread, Biscuits, Cake, Wheat and Maize Milling activities, Pearsall (1937). With the exception of Maize and Breadmaking (Transvaal), the other activities were mainly Cape-based. Tobacco and cigarette manufacture has long been the preserve of a single company, Rembrandt, whose origins lie in the Voorbrand Tobacco Corporation. Its products were distributed in Broederbond meetings in the early 1930s, and the company subsequently grew to control

the international cigarette company, Rothmans, among other diverse activities.[19] Maize milling, on the other hand, was geographically located in the Transvaal near its main markets provided by the mines. Ownership was less concentrated, though some early ownership linkages existed between mining houses and millers. Premier Milling was, in 1896, linked to the Corner House Group (the forerunner to Rand Mines). Kaplan (1986) observes that this activity, like most of manufacturing in South Africa, was gradually concentrated through a series of mergers.

TABLE 3.2 - FOOD AND BEVERAGE INDUSTRY - DISTRIBUTION OF ESTABLISHMENTS, 1937-38

	% of Total Establishments
Flour & Grain Mills	43.1
Bakeries	18.4
Aerated Water Works	7.8
Butter & Cheese Factories	6.4
Fruit Factories	3.5
Salt Factories	2.5
Tobacco Works	2.5
Ice Works	2.2
Distilleries	1.8
Coffee Works	1.4
Malt Works	1.3
Sugar Mills	1.1
Tea & Fruit Packers	1.1
Fish Canneries	1.0
Other Establishments	5.9
Total	100.0

Source: Smith (1945).

Such a cursory overview provides some limited evidence of disparate development in the food industries, in part as a consequence of the absence of coherent industrial policy. Further concerted study is urgently

19 "We were asked to smoke and cough for Volk and Vaderland", recounted an old Bond member, cited in Wilkins and Strydom (1978, p.425).

needed. But the apparently separate experiences of the wine and dairy industries, for example, follows from differences in their economic and political leverage, but this is in part mutually derived from autonomy from central direction.

2.2 POLICIES TOWARDS INDUSTRY

There were two major industrial policy instruments utilised in the inter-war period; first, tariff protection and, second, the creation of a state sector around heavy industry whose initially stated objectives, among others, were to cheapen industrial inputs and strengthen linkages between mining and manufacturing.

A major focus of debate has been over the reasons for protecting manufacturing. Kaplan (1974, p.90), in particular, insists that protection was primarily designed to serve the interests of manufacturing as opposed to those who see it as part of civilised labour policy, meeting the needs of poor white workers:[20]

> Where the two objectives of "civilised labour" and industrial development conflicted ... the government came down firmly on the side of local industrial development.

Some, such as Innes and Plaut (1978, p.57) combine the two motives. Martin (1990a and b) takes a broader view of the goals of indigenous industrialisation through protection, incorporating the construction of South African manufacturing hegemony in the Southern African region as a whole. He views this as representing a break in policy from 1925, in part to reduce dependence on gold mining, although this was tempered in the 1930s following

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[20] In a retrospective and official account of the development of industry in the context of the role of the Industrial Development Corporation, Rosenthal (1960, p.8) sees providing employment for the "poor white" class as important. For Horwitz (1967, p.251):

> The empirical examination has shown however that the polity accepted and applied a protectionist policy only because it promised increased, improved employment of Whites, otherwise described as "civilized labour". That this was the raison d'etre of industrialization, if needs be under the encouragement of protection, is brought out unequivocally by the Customs Tariff Commission of 1934 as well as by the launching of a state-controlled iron and steel industry by the Pact Government.

On the issue of white labour, see Gool (1983), Yudelman (1983), Johnstone (1976) and Davies (1979). On poor whites, see especially Abedian and Standish (1985).

increases in the gold price. For Norval (1962, Chapter V), tariff policy combined a mix of motives - providing for poor white employment, raising government revenue, protection for existing or (to be) newly established industries, safeguards against dumping, and not to harm unduly the interests of agriculture, mining and the availability of capital goods and raw materials.[21]

These different perceptions of the role of protection derive more or less directly from the correspondingly identified economic interests, these varying as between authors (and their analytical prejudices) and over time. If the belief is that the Pact Government represented a swing towards the interests of national capital and/or white labour, so it is argued that protection was introduced on their behalf, etc.

More recently a sharp interchange between Christie (1991a and b) and Martin (1990b and 1991) has centred on the relative efficacy of the dual policy instruments of protection through tariffs and the creation of state-owned heavy industry. Christie emphasises the importance of underlying infrastructure provided by state agencies such as the railways, Escom and Iscor and, consequently, the role of individuals such as Smuts, Hoy and van der Bijl. Although much is made today of providing the economy, particularly manufacturing, with a "kick-start", for Christie, the thirties primarily enjoyed the benefits of an "electric start". As such, the benefits were available to all capitals and not necessarily favouring domestic capital. Indeed, mining inevitably enjoyed disproportionate benefits, raising doubts over the potential role of such state ventures to promote indigenous capital at its expense.

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[21] For broad discussion of the policy and empirical issues involved in inter-war protection, see Archer (1981).

Martin (1991, p.610), on the other hand, attributes the degree of inter-war industrialisation to, "the emergence for the first time in South Africa of a definite policy of industrial development and, as an essential and integral part of this, protective tariffs". However, he reads this off as part of a global structure in which South Africa's position as a semi-peripheral country was bound to condemn attempts at industrialisation to failure, p.616:

> For primary producers and especially mining capital, profits and continued expansion seemed best assured by the reproduction of a peripheral position in the global division of labour. To break these globally and regionally constructed relationships threatened not simply tariff-induced higher costs, lower profits, and the loss of easy access to overseas and regional markets, but the very structure of dominant class alliances across Southern Africa and core areas of the world-economy. As the relatively autonomous Pact government moved in this direction - by reshaping tariffs, state intervention, and regional and international foreign relations, and so on - it accordingly came into conflict with mining and commercial capital, much of agricultural capital, and the dense web of academics, policy-makers, and ideologues who maintained that South Africa's proper destiny was to form a primary planet circulating the bright if declining sun of Britain.

The heavy emphasis on tariffs is contested by Christie who points out that they were low in contrast to other colonial countries. Martin replies by arguing that

aggregate tariff levels are irrelevant since they were designed to target particular industrial sectors.[22]

However the dispute over the advantages, disadvantages, strengths and impact of protection is resolved, it is much more important to recognise the implicit assumption that tariffs, together with the promotion of state-owned industries such as Escom and Iscor, are considered to be the core of industrial policy. But what stands out is not the greater or lesser role of protection as much as the failure to adopt an additional range of industrial policies, promoting manufacturing through provision of skills, technology, finance, intersectoral linkages and marketing. Even the taxation system seems to have discriminated against such diversification. According to Kaplan (1977, p.270):

> Companies whose principal business was gold mining were taxed at 4/- in the pound on all profits earned on non-mining activities. This compared with 2/6d in the pound taxation rate on all other companies.

Although he reports this as not being too significant an impediment to diversification into industry, it did prove so for Anglo-American and attracted the opposition of the Chamber of Mines.

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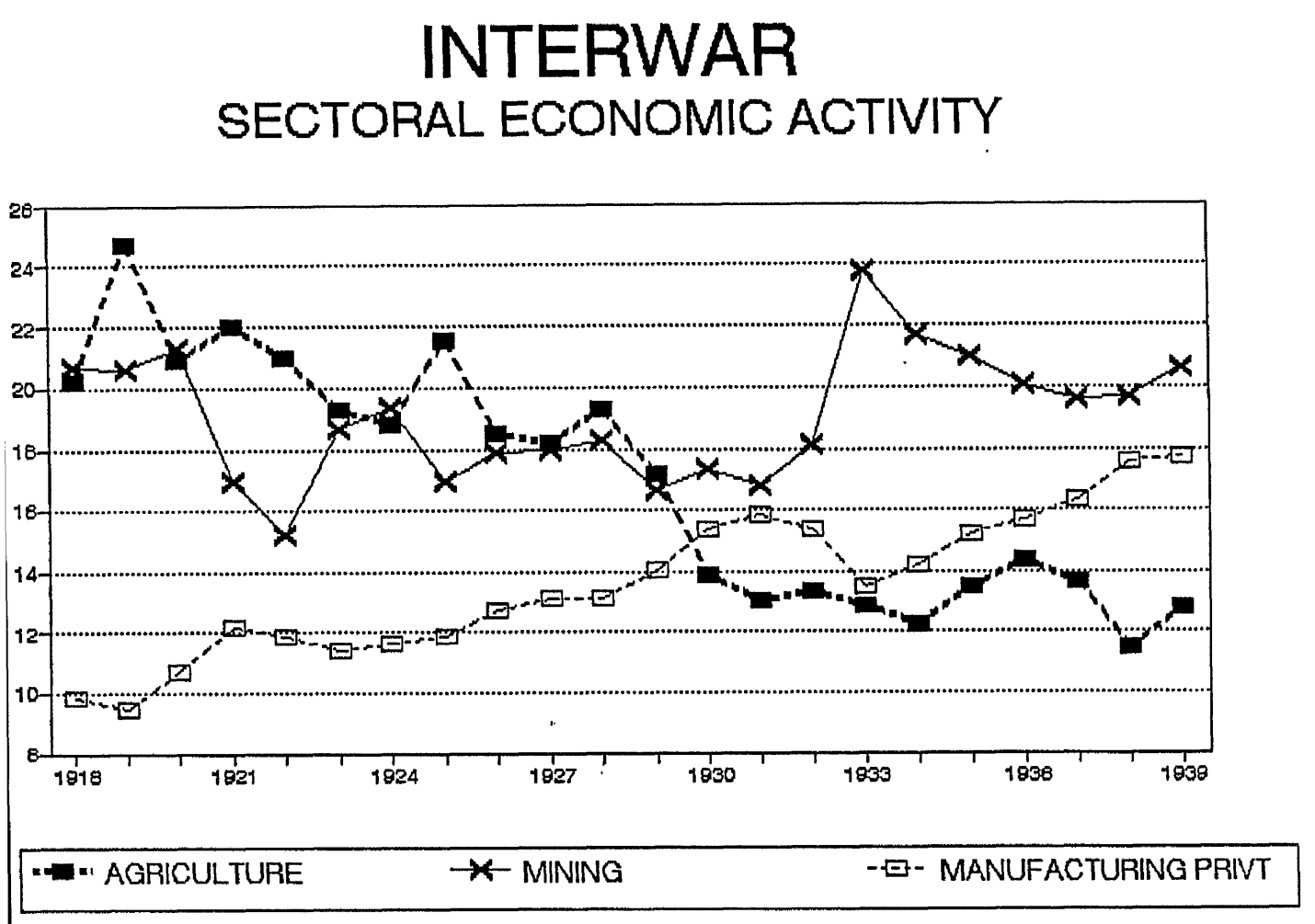
22 Martin's approach is based on the idea that protection is doomed to fail as a policy to develop indigenous capital in the periphery. Ironically, this view of the inevitable subordination to the needs of metropolitan capital might be better supported by Christie's analysis than by his own, since the former suggests that state corporations were more wedded to the interests of mining (metropolitan) capital.

FIGURE 3.2 - INTER-WAR MANUFACTURING SUB-SECTORAL ECONOMIC ACTIVITY



Source: Norval (1962, p.9).

Such a broader range of industrial policies, however, could only have been effectively and significantly based upon support for diversification out of mining. The extent to which this had already taken place prior to the inter-war period has not always been acknowledged, not least partly because the concept of industrialisation has been primarily dealt with in aggregate quantitative terms. The empirical analyses found in most of the literature on the inter-war period tend not to differentiate economic activity across the diverse sub-sectors within manufacturing and are, consequently, insensitive to both detail and timing.

A useful starting point is to consider the development of the steel industry, which falls within the Metal and Engineering sub-sector of manufacturing. As Christie (1991a, p.604) observes of plans for Iscor:

> (They) were personally initiated by Smuts as a state sponsored project, in 1922. Smuts went to great lengths in 1922 to persuade Lionel Phillips, Solly Joel, the Albus, Ernest Oppenheimer, and other goldmine owners to invest in an iron and steel industry that would be partly state supported ... Smuts passed a scheme through Parliament in 1922 whereby the state would pay bounties to any large-scale iron and steel producer in South Africa ... This bounties scheme was taken over by the Pact as late as 1926. Only once the scheme was clearly a failure did the Pact create Iscor ... In short, the Pact created Iscor but it could only do so because of Smut's extensive previous work.

In interpreting this critical period it is crucial to appreciate the extent to which a privately-owned domestic steel industry, based on recycling scrap steel, already existed in the early 1920s and, more importantly,

the extent to which there was competition over plans to expand by shifting to the primary smelting of ore. In 1924, nine years before Iscor began production, the sector already contributed 18.8% of the manufacturing sector's gross output. Simply because of the capital requirements and economies of scale associated with steelmaking, the bounty system could only realistically be extended to one producer and the contest for this concession was played out between the Union Steel Corporation (Usko), wishing to expand its smelting works in Newcastle (based on scrap steel), and the Pretoria Iron Mines (PIM), supported by the Pretoria lobby.

It would be inaccurate to categorise the Union Steel Corporation at that time as imperial capital when compared to the Belgian, German and British companies that supplied most of the steel used in the Union. Even if Usko were to be regarded as representing imperial capital, close relations necessarily existed with the state. The viability of Usko (and other companies such as Stott and Company and Dunswart) were dependent on the close cooperation of the state (mainly through the railways who provided scrap for smelting and who were also major consumers).[23]

PIM was very definitely aligned to Afrikaner interests but, while Usko's initial capital was subscribed in England, the company was controlled by Lewis and Marks, the latter having had a long association with Boer Republics, Mendelsohn (1991).[24] Even so, Mendel Kaplan (1986, p.98) records that C.F. Delfos, the owner of PIM, had unsuccessfully attempted to raise capital in Britain as early as 1924 for expansion. Subsequently:

> (He) approached the board of the Gotehoffnungshotte "to prepare a report on the possibility of

[23] Much of what follows draws upon Richards (1940).

[24] Many economic analyses proceed as is there were no differences amongst Afrikaner "interests", and O'Meara (1983) has clearly illustrated that there are, by sector and by location, for example.

> establishing an iron and steel industry". In 1924, also, the Pact government came into power, not only keen on promoting South African industry, but more in sympathy with Delfos's own political views than the Smuts government which preceded it.

The evidence points to a municipal/regional lobby, with Pretoria's strongly underpinned by Afrikaner nationalism. Within this melee, Delfos' lobbying for a state-owned enterprise is interpreted by Kaplan (1986, p.98) as his last resort to raise capital to compete with Usko (although Kaplan elsewhere suggests anti-semitism as a motive):

> During the recess of 1925, Delfos made his first approaches to Pretoria Members of Parliament and began campaigning for a public utility company similar to that of Escom ... Delfos, unable to obtain sufficient capital to expand his own business, was inspired by the foundation of Escom in 1923, and then determined to compete with Usco one way if he could not do it in another. He was obsessive about it.

To assert then, in the events leading up to its formation, that Iscor was created by an act of the state in support of national capital against imperial capital is superficial and quite misleading. Clark (1987a, p.122) observes that:

> The state corporations did not so much challenge private capital nor work as a "tool" of private enterprise, but rather they provided a growing link between the state and the private sector.

The tensions inherent in its conception persisted, deepened and broadened as it grew. After Iscor began producing, it was forced into joint ventures with

finished steel companies, "agents" of imperial capital, in order to guarantee its markets. Ultimately it had to come to an accommodation with European producers, joining their international cartel in 1935, reserving just one-third of the domestic market for itself and the other local producers, but raising prices for all.

The Pact government's decision did not simply favour the interests of domestic over imperial capital. Within the state itself, the railways had to pay higher costs for steel[25] while, on the other hand, the Customs and Excise raised higher revenues from tariffs and the steel parastatal made huge profits. Imperial capital, as represented by the mineowners, did have to pay higher costs for their steel inputs but steel producers in Europe and the USA benefited from higher prices arranged for their exports. Of greater importance to the development, or rather the stunting of domestic industry, many domestic users of steel (such as the fabrication shops, engineering sector, etc.) suffered under the burden of higher costs of steel.

In fact, the impact of Iscor's output on the economy is not accurately reflected within the metal sector alone, for the company reported its activities under four categories; namely, Iron and Steel; Gas, Coal, Coke, and Tar; Electric Light and Power and Lime Works. Nevertheless, it is important to note that at the aggregate level, the £3.5m capital expenditure on Iscor between 1929 and 1933 represented only 4% of total manufacturing fixed capital. This is not to dismiss the importance of Iscor in the economy, but to highlight how misleading it is to read too much from the interplay of interests within a single sub-sector of manufacturing (even if these have been correctly read in the first place).

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25 Of the total primary and secondary iron and steel consumption in South Africa, the railways consumed 17.2% and the mines 41% between 1932 and 1937.

The policy instrument of creating state industries cannot simply, nor even primarily, be interpreted as support for domestic capital. Nor was industrialisation necessarily guaranteed as a result of such industries. In the case of the creation of Escom through the 1922 Electricity Act, it is important to note that throughout the inter-war period, Escom remained in a subordinate position to the privately-owned Victoria Falls and Transvaal Power Company (VFTPC) which served the lucrative mining contracts, partially by the delivery of power generated by Escom.[26]

Thus, state enterprises certainly reflected the economic and political disjunctures of the inter-war years, but in ways that substantially differed according to the resolution of compromises and conflicts. Dependence of power and metal on markets provided by mining, for example, endowed that fraction of capital with much greater leverage than for the railways which served, like protection, as a preferred policy instrument for Afrikaner capital. In such a situation, it was both difficult for state enterprises to serve as the commanding heights for a coherent policy of industrialisation. Furthermore, neither Afrikaner nor mining capital could reasonably command such a vision.

2.2.1 CHEMICALS

Figure 3.2 for sectoral composition of manufacturing indicates that the chemicals industry was relatively well-developed by 1924, contributing 8.3% to industrial output, at least as much as the Heat, Light and Power sector. This sector highlights two important features of industrialisation in South Africa. First, it has

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[26] The VFTPC was ultimately bought by Escom after the second world war, with finance provided by the Anglo American Corporation. See Clark (1987b, p.268) and also Christie (1984).

frequently taken place around, and in support of, mining activities. Second, despite the phenomenal achievements of such industries, they have often failed to develop and diversify.

The Modderfontein factory, built in 1895 by the Nobel explosive monopoly, was the largest dynamite factory in the world and the largest single industrial plant in South Africa at the time. Expansion of this industry was driven largely by its proximity to the mining industry, by economies of scale and by conflict between various fractions of imperial capital.

Imperial mining interests, in striving to reduce costs, built their own dynamite plant in the Cape in 1898 to challenge the Nobel monopoly and, through the Transvaal Chamber of Mines, set up an explosives supply system that survives to the present day. A third imperial competitor, Kynoch, set up a plant in Natal after the Boer War in 1903, and competition between these three producers led to the beginnings of diversification, initially limited to backward integration through, for example, the production in 1911 of a key input, glycerine, from whale oil.

The early development of the chemicals sector was governed by corruption and collusion between various organs of the South African state and various fractions of imperial capital. The collusive arrangements particularly centred around arms manufacture, which were viewed as strategic, and such considerations have influenced many subsequent decisions on industrialisation in South Africa.

It is partly due to the lack of an industrial strategy, both before and after the Pact, that the potential for diversification was not fully realised. By 1911, long before the Pact government which supposedly

favoured industrialisation, the chemicals industry (mainly explosives) was the largest sub-sector of manufacturing, capitalised at £2m and employing 3,000 workers. It was the largest single importer of raw materials into South Africa, the largest single source of revenue to Natal Railways and a very large source of revenue for the Cape Railways, Cartwright (1964, p.119).

Some further progress was made. De Beers' Cape Explosives plant at Somerset West even purchased a ship and began exporting explosives to Australia on the eve of the First World War. A detonator plant was built between 1917 and 1920. Paint manufacture even began in 1918 by virtue of an accident of a British paint manufacturer. Its agent had mistakenly ordered five years of normal supply and, after delivery, the parent company had to ship a second-hand paint mill to reprocess the paint to avoid deterioration. Yet these diverse forays were not sustained.

Mergers between explosive companies in Europe in 1924 were followed by the same in South Africa in 1925 and allowed the introduction of the revolutionary ammonia synthesis process from coal in 1930, dispensing with imports of Chilean nitrates. Foreign exchange outflows on Chilean nitrate imports were replaced by a royalty payment to ICI of between £2 and £4 per ton of ammonia produced. Furthermore, as Cartwright (1964, p.191) observes:

> This was an ICI project from start to finish. ICI engineers designed the plant, manufactured a great deal of the equipment and supervised the erection, which was carried out by the factory staff. Wade and Dorman of Johannesburg were responsible for the structural steel work, and Stuart of Germiston built the foundations.

The merger also facilitated diversification into fertilisers. However, it was limited, not least because of a lack of support on the part of the state. The superphosphate plant at the De Beers Somerset West factory shut down in 1921 after only operating for a few months due to Dutch dumping and the refusal of the Government to raise local prices through tariffs. It feared, "losing ground in the country districts (and) was anxious not to antagonise the farmers by imposing a duty that would increase the price of fertiliser", Cartwright (1964, p.163).

Thus, Pact policy, in regard to explosives and fertiliser manufacture within the chemicals industry as a whole, is best interpreted through the prevailing disjuncture between economic and political power. While it was acceptable to subsidise food manufacturing industries whose inputs were based on subsidised agriculture, the government was seemingly not prepared to subsidise agricultural inputs, particularly since the industries producing them were under imperial control. After the merger in 1925, the domestic explosives and fertiliser industry was jointly owned by De Beers and ICI, both regarded as imperial capital.

Other sectors of the chemicals industry exhibited similar patterns. They were usually based around the mining industry. Rand Carbide, for example, began carbide production in 1926 using lime and coke in electric furnaces. By 1930 it was the VTFPC power utility's largest bulk industrial customer with the exception of a few of the gold mines. The major demand for carbide was from the mines but the factory apparently became a major exporter for a while, Christie (1984, p.93). Similarly, the pulp and paper industry was only set up on any scale in 1936 by the Union Corporation, a major mining house with headquarters in London, Hocking (1987).

Liquid fuel production in the inter-war period was centred around the mining and retorting of torbanite. The first torbanite plant was set up by the Natal Mineral Oil Company in 1895 to extract paraffin from shale. This was followed by the Oil Shale Development Company in 1913 with oil shale mines in Natal, Transvaal and Swaziland. In 1934, the first South African oil refinery was set up in Boksburg by an Anglo-Transvaal (Anglovaal) subsidiary, South African Torbanite Mining and Refining Company (Satmar). It processed imported crude and shale oil, retorted at its Ermelo shale mine. Two factors underpinned the plant in the 1930s. First, the natural protection of the inland market through railway freight rates, tariff protection for local manufacture and, during the war years, the irregular imports of crude oil. A large proportion of the inland market was supplied by this plant.

The history of Anglovaal itself illustrates the centrality of mining to industrialisation and its importance as a source of finance and surplus:[27]

> The only big businesses by world standards were the mining companies ... To be a big mining house you need lots of mines and to have lots of mines you had to be prepared to spend tens of thousands of pounds on holes in the ground looking for them - and that's money written off the moment it's spent. So they decided very soon that they needed to diversify so that they could start businesses based upon local raw materials, satisfying local needs, and raising money for those needs on a booming stock market - which boom wouldn't go on for ever. So within three years of inception we were into petroleum refining, cement and bricks and tiles. (We got out of the bricks and tiles two years later. I think we burned

[27] Interview with Clive Menell, Deputy Chair and joint-owner of Anglovaal, by Mendel Kaplan (1986, p.110).

> our fingers.) And so from the very start, the premise was that we would start those industries, then in a period of years move them up so that they would throw off cash, some of which we would spend on holes in the ground to find mines which, in their turn, would throw off cash, some of which we would use to build more industries - and lever our way forward on a diversified base on the basis that matters don't go wrong all at once ... We were diversified from inception, unlike many mining houses who grew rich and made their fortunes on mines and only at a time that they had these riches did they look for other opportunities - and diversified then.

Anglovaal, a corporation with indigenous roots through both ownership and finance, appears to have been able to challenge imperial capital through a judicious and explicitly diverse investment strategy. This possibility of domestic equity financing seems to have been completely missed by Norval (1962, p.96) who justifies the establishment of the IDC by arguing that:

> The industries which developed under the stimulus of the customs tariff protection inaugurated in 1925, found very little if any organised financial backing on which to rely. Financial institutions such as the industrial banks in the older countries, for instance the four D. banks in Germany ... the banques d'affaires in France, the organised industrial share and capital market and in particular the investment trusts in Great Britain and the United States of America were wholly absent in South Africa. The larger industrial concerns such as AECI, Stewarts and Lloyds, Lever Brothers, Price's Candles, Cadbury-Fry, Nestle, the motor assembly plants, the tyre factories and many others, all South African branches of overseas concerns

were, in the main, initially financed by their parent companies, which thereafter ... ploughed back their profits to finance further developments and expansions ... many other concerns in the industrial field in South Africa developed on the strength of financial reserves built up from within and with such other resources as could be obtained from friends or from the commercial banks by the way of overdrafts or other forms of trade credit.

As a generality, the example of Anglovaal shows this to be false. Highly capital-intensive industries were developed in the inter-war period by national capital, largely from within accumulation through mining. But, more importantly, this took place in the absence of any clear state industrial strategy save for tariff protection. What Anglovaal achieved as domestic capital might well have been dwarfed by diversification from the large mining companies, if they had been secure in economic and political support.[28]

2.2.2 DIAMONDS

The uneasy relationship between state and capital is best illustrated by the diamond industry. It shows how mining capital could frustrate the state's economic goals in sustaining the activity of capital located within South Africa. One of the early acts of the Pact Government was to introduce the Diamond Control Bill in July 1925. Newbury (1989, p.258) describes it thus:

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[28] Ehrensaft (1985, p.81) uses the term "flywheel effect" to describe the potential use of gold as a source of state-promoted industrialisation. For the view that secondary industrialisation depended upon (the foreign exchange earnings of) the gold industry but was not integrated with it, see Lumby (1976) and (1977). For the latter, p.143:

> Thus, rather than assisting the secondary sector to develop as a substitute for the gold mines, the local printing industry remained dependent upon the foreign exchange earnings of the gold mines for its continued existence.

> The government now had an instrument which it could use to determine quantities produced, set minimum prices, and call for returns of production. All sales agreements required ministerial approval. A "Diamond Control Bill" might be established to buy and sell, issue advances, and fund monopoly sales through its own officials.

But he concludes:

> Very little of these Draconian powers was ever brought to bear on the industry; but the threat was there, unless the merchants and companies set their house in order.

What the state required as a minimum, as indeed did the industry itself, was a cartel to limit the output finding its way onto the world market in order to sustain prices - from which the state would benefit from its allocated share of revenue. From its earliest days, the industry had struggled to attain a collusive monopoly over marketing on a world scale, its arrangements always subject to erosion by the emergence of new sources of supply.[29] Despite the weight of South Africa in world diamond production, cartels had always been organised by international capital located in London, so that the South African government could at most be an influence on, not a determinant of, marketing arrangements. Thus, state control of the diamond industry was at most negative in the sense that it could have disrupted attempts to cartelise by raising and marketing its own output, but only at the expense of the market as a whole and its own revenue as prices collapsed.

This is illustrated by developments over the inter-war years. The 1920s were to witness Ernest Oppenheimer

[29] For the early history of the industry, see Newbury (1989), Turrell (1987) and Worger (1987). See also Fine (1992c).

gaining control over the industry on behalf of Anglo-American through De Beers and his cementing a cartel together. One issue within South Africa concerned alluvial diggings which had provided a source of employment for independent small-scale white mining. Gregory (1962, p.171) reports of the Precious Stones Act of 1927:

> "The main principle underlying this measure", said the Minister (of Mines), "is that alluvial diggings, subject to the interests of the State, and a fair participation of the State where necessary and desirable, should remain the reserve and preserve of the small man".

He wryly observes:

> The principle of reserving alluvial digging for the "small man", whether justifiable or not as a measure of social and economic justice, did not in itself meet the essential needs of the situation as it was in 1927, namely, the control of output which was, however, <u>also</u> provided for in section 115 of the Act.

By 1929 the independent diggers had all but disappeared, and by 1931 De Beers had control over all major diamond production in South Africa.

The 1930s presented rather different problems, even if derived from the same imperative of limiting supply, only now in the context of collapsed demand on a world scale. Other than buying up and stockpiling excessive quantities of gems, how was diminished overall levels of demand to be allocated between the different sources of supply? For the South African state, this became a matter of sustaining both its revenue and (white) employment on the mines. De Beers, however, sought to keep the diamond

cartel together by adjusting its own South African output. For Newbury (1989, p.364-5):[30]

> The clash between diamond capitalists and the Pact politicians centered on the crisis of overproduction and not on the politics of "Afrikanerisation" or job protection at the work place. The tensions were real enough, however, and lasted from 1924 till about 1933, beginning with a breakdown in contractual monopoly and ending in accommodation between merchants, producers, and government during reconstruction ... In effect, the industry climbed out of the crisis of the 1930s because South African diamond production was used as the regulator for a measure of control by the Diamond Corporation over total diamond purchases inside and outside the Union. Mines were closed and purchases were held back from resale in the late 1930s, while outside minimum sales contracts and the rise of bulk diamond sales favoured West and Central African producers.

Conflict focused on the closure of the Premier Mine in March 1932 for which the government did not give permission and De Beers did not give adequate notice as was required by agreement.[31] After this point, as market conditions improved, the government was reconciled to its subordinate role, Newbury (1989, p.371):

> The South African government then became a partner in the corporation which rationalized its functions to deal with production at home and overseas, and market gem and industrial goods through the London channel.

In short, policy around the diamond industry cannot be seen as a simple conflict between imperial and domestic

[30] See also p.375 and p.369.
[31] See also Gregory's (1962, pp.246-7) discussion.

capital (and white labour). The exercise of the government's political power was severely constrained in particular ways by the economic structure of the industry on an international scale (just as for steel and its, rather different, arrangements for a global cartel).

Nevertheless, the extent to which industrial diversification is possible in the absence of a cohesive industrial strategy is illustrated by the emergence from South African diamond mining of one of the country's most successful industrial corporations.[32] The fall in international demand in the 1930s, despite De Beers having a global monopoly, precipitated the development of uses for boart, what was then essentially a by-product of the mining of gem diamonds. The forerunner of Boart International, began in Johannesburg researching and developing a composite diamond impregnated drill bit in 1936. Since then, Boart has diversified into a range of activities utilising diamonds including cutting, abrasives and contract drilling. At its peak in the early 1980s, Boart controlled 100 companies and employed 17,000 people in 28 countries.

[32] What follows is from a variety of sources

CONCLUSIONS

In looking back at the inter-war period and in looking over the literature that has confronted it, a number of conclusions emerge. First, the correctly recognised disjuncture between economic and political power has been too simplistically examined. This is reflected in an overemphasis upon the class agencies involved without due attention being paid to actual and potential economic linkages and structures. The strategy of developing national capital was heavily circumscribed by the unacceptability of its being primarily based upon diversification out of the economy's strength in and around mining.

Second, this one-sided analysis is also symbolised both by the absence of industrial studies and by the continuing ambiguity over the term "industrialisation" itself.[33] The South African economy, in the scholarly and popular literature, has gone through (secondary) industrialisation so many times - around the turn of the century, when stimulated by the wars, in the thirties, and in the fifties and sixties - that it comes as a surprise to find that it is now once again suffering from a crushingly uncompetitive and inadequate industrial sector.

Third, how is the story to be brought forward from the inter-war period? In retrospect, it is now known that Afrikaner capital has been built up, not perhaps to be on a par with English capital, but with sufficient strength,

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[33] For an index of the weakness of South African industry and industrial policy, consider the performance of the IDC over its first twenty years for which, as Norval (1962, p.98) reports:

> In 1959 the Corporation had investments in 75 companies for a total amount of just under R130 million of which just under R104 million was invested in three concerns. The balance was invested in 72 companies in the normal course of its business.

On average, other than for state corporations, that is less than R400,000 per company. Excluding SASOL, in 1990, the IDC had invested just under R5 billion in almost 4,000 projects, a little over R1 million per project.

interpenetration and cooperation with it that their common interests are and have been closely coordinated and served by the state. The historical route to this outcome has, however, primarily been through the growth of finance houses which, together with what was a continuing state priority to such indigenous capital, foreclosed an industrialisation strategy based on diversification out of mining and its related activities.

This history's significance for the future is found in the irony that, just as the various fractions of capital operating in South Africa are open to coordinated state policy in formulating industrial strategy, the apartheid system should itself be in crisis. Nonetheless, for a future government, the technical option does exist to benefit from the infrastructural capability and economies of scale and scope that have been created in and around mining and which has not been previously fully exploited. Whether political conditions allow is another matter.

CHAPTER FOUR

THE POLITICAL ECONOMY OF POST-WAR INDUSTRIALISATION IN SOUTH AFRICA

INTRODUCTION

The purpose of this chapter is to review post-war industrialisation in South Africa, tracing the historical evolution of the Minerals-Energy Complex (MEC) in order to address its impact upon the South African economy in the past as well as to assess its implications for the future. In chapter 1, it has been argued that the South African economy has been and is increasingly dominated by the MEC. To some extent the influence of this complex has been overlooked, and the degree of South Africa's industrialisation exaggerated, by the way in which industrial statistics have been constructed. Much that is designated as manufacturing might either be reasonably classified as belonging to the MEC or be so closely linked to it for it to be included as such for analytical purposes. The purpose here is less to draw precise quantitative boundaries between what belongs to the MEC as opposed to what lies outside it as to point to a particular system of capital accumulation that contains the MEC at its core with a determining influence on the rest of the economy.

The position of the MEC during the inter-war period was determined by the disjuncture between Afrikaner political and English economic power which impeded industrial diversification out of the core activities of the MEC, chapter 3. What has been witnessed over the post-war period is the erosion of this disjuncture, predominantly unobserved or taken for granted in contrast to its earlier presence which has been more readily

recognised.[1] But the route by which this articulation was accomplished, and its content and consequences, whilst uneven across separate components of the economic and political formation, has a definite periodisation in which Afrikaner capital first emerges to prominence in the 1950s under state tutelage prior to its integration with the previously exclusive stronghold of English mining capital. But the latter did not stand idly by, and the evolution of the MEC up to the 1960s is traced in Section 1. Section 2 discusses large-scale Afrikaner capital's interpenetration into mining and other activities in the 1960s supported, in particular, by the component of industrial policy that was effected by state-owned corporations in steel, chemicals, fuels and energy.

The resulting commitment to public and private investment in energy, mining and mineral processing related sectors after the gold and energy price rises in the 1970s was the first signal that large-scale capital had been integrated economically and politically within an industrial policy. Section 3 discusses this strengthening of the MEC. But the costs were to be felt in the failure to develop and to have developed a coherent commitment to industrialisation much beyond the immediate concerns of core mining and energy activities. This, as much as the impediments imposed by apartheid policies, explains the continuing structural weakness and paradoxes of the South African economy, as presented in Section 4.

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1 The debates around the disjuncture include Davies et al (1976), Freund (1989), Yudelman (1983), among others. For a review of these, see chapter 3.

1. ERODING DISJUNCTURES - THE DEVELOPMENT OF AFRIKANER CAPITAL

The disjuncture between English and Afrikaner capital, which constrained industrial diversification out of the MEC during the inter-war period, was also apparent in the 1950s. Its erosion, while varying in rhythm and extent across sectors, was evident in the relations of conflict and compromise between English capital, on the one hand, and Afrikaner capital and state institutions on the other. In the 1940s and 1950s, the latter grew in strength, by the promotion of Afrikaner interests in general but, particularly, through the promotion of Afrikaner capital and its deployment in productive activities which, in the inter-war period, were largely the preserve of English capital.

The process of accumulation around the MEC in the 1950s included the expansion of gold mining, electricity, coal and chemical sectors and the financing of these activities. In the financial sector, the creation of a long-term capital market addressed the collective demands of productive activities within the MEC, but conflict resulted from state patronage of Afrikaner financial interests and similar dichotomies emerged within the electricity, coal and chemical industries and are discussed below.

1.1 AFRIKANER CAPITAL IN THE 1950s

There is no doubt that the Nationalist Government supported Afrikaner economic and social advance upon assuming power. One of the best accounts of this is to be found in Lazar (1987) because of his concern to trace the evolution of Afrikaner politics and ideology in response to changing economic stratification. Our contribution is

to locate Nationalist support for Afrikaner capital in the context of the MEC.

Apart from a purge of government jobs to make way for Afrikaners, p.38:

> Afrikaner farmers, financial capitalists, small traders, and workers all received massive direct and indirect hand-outs from the government in the decade after 1948.

Following the development of secondary industry in the war, based on the growth of both public and private investment, Lazar finds that Afrikaners already owned 3,385 factories, but only employed 14,450 white workers (little more than four per enterprise) out of a total of 170,959 and controlled 6% of industrial turnover by 1948. Yet, of white male workers, they constituted 86% of the unskilled in industry in South Africa's principal cities, 79% of mine workers, 74% of rail workers, and 63% of factory workers. Afrikaners made up only 5% of directors of companies and 15% of professional workers. Per capita income of English-speaking whites was twice that of Afrikaners.

Lazar points to three trends associated with the promotion of Afrikaners; the growth of white collar employment, the polarisation of Afrikaner agriculture, and the rapid expansion of major Afrikaner corporations for which financial enterprises were most prominent in the first instance. For farming, support through the state to the sector that was and remained dominated by Afrikaners, gave rise to rapid development of large-scale, mechanised capital alongside an often marginal and precarious small-scale sector, pp.108-9:

> By 1960, a relatively small number of powerful farmers and "land capitalists" controlled a sizeable

proportion of South African agriculture. Undoubtedly, some smaller farmers also benefited from the huge government input into this sector of the economy. But a growing number of poor farmers forsook the land for the towns; the livelihood of those who remained behind on over-divided uneconomic tracts was only guaranteed by government aid. While the grootboers grew richer from the fruits of a lucrative decade (1950s), the kleinboer (small farmer) seems to have become poorer, or given up altogether.

Only 16% of all economically active Afrikaners were employed in agricultural occupations by 1960, compared with more than 30% in 1946 and 23% in 1954-55, p.97. They had migrated to the towns in search of the higher rewards to be found in waged labour. Much of this was within the public sector which employed 30% of whites by 1960, many of them white collar employees who had benefited from enhanced levels of educational provision. Income differentials remained to the advantage of the English-speaking but had narrowed considerably. Nonetheless, there was only a limited advance in the numbers of Afrikaner owners, managers and directors, their making up 26% of the total in 1960.[2]

Afrikaner capital in the 1950s, the main beneficiary of this process, was represented by four important groups, three of which (Volkskas, Sanlam, Rembrandt) were large, centralised and involved themselves in a number of diverse and also overlapping activities. The fourth group consisted of a large number of small-scale commercial and industrial enterprises, geographically concentrated in the rural areas of the Transvaal and the Orange Free State (OFS).

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2 To some extent, this casts doubt on the commitment to the promotion of small-scale Afrikaner industrial capital by the Nationalists. Phimister (1991, p.441) argues this, contra Kaplan (1977), in view of the 1948 Customs Agreement between Southern Rhodesia and South Africa which favoured small-scale business in the former at the expense of the latter.

The Afrikaner economic movement initiated in 1934 and shaped at the first Economiese Volkskongres in 1939 had, by 1950, effectively consolidated Afrikaner capital's structure but had not significantly raised its share of national economic activity. In the financial sector, although the share of total funds controlled by Afrikaner institutions rose from 5% in 1939 to 6.16% in 1950, what was important was that these funds had been centralised and concentrated in the hands of two or three institutions, O'Meara (1983, p.205). Manufacturing enterprises were very closely linked to the processing of agricultural produce through co-operatives with 80% of the firms located in rural areas. They were small-scale in nature, 85% being single-person enterprises. Afrikaner capital was virtually absent in mining activities but a significant presence had been established in commerce, although many of the enterprises concerned were small. 75% were single-person, and most progress had been made at the expense of Indian traders evicted in the Transvaal.

TABLE 4.1 - THE GROWTH OF AFRIKANER CAPITAL, 1939-1949

	£m Turnover		%Afrikaner	
	1939	1949	1939	1949
Commerce	28.0	203.7	8	25
Manufacturing	6.0	43.6	3	6
Finance	27.0	74.4	5	6
Mining	1.0	1.0	1	1
Total	61.0	322.7	5	11

Source: O'Meara (1983, p.182).

With the exception of the financial institutions, most of these small-scale enterprises could not compete with established "English" competitors. Politically, however, they could not be ignored, although their influence on the economic discourse of Afrikaner capital

waned during the 1950s. The Afrikaner economic movement had been, O'Meara (1983, p.200):

> initiated as a result of a wary cooperation of the driving forces behind each of the two companies - on the one hand the young financiers around W.A. Hofmeyr (Sanlam), led by M.S. Louw, and on the other hand the theoreticians and Bond activists who sat on the Board of Volkskas. Sanlam and Volkskas were without any question the prime beneficiaries of the centralisation of capital aimed at by the economic movement. The 1940s thus gave rise to two powerful Afrikaner financial groups, each based in one of the two most important centres, the Cape and the Transvaal, and each directly linked to a different faction within the nationalist movement - Sanlam to the Cape National Party (NP) and Volkskas to the Bond, which dominated northern Afrikaner nationalism.

Successful competition with English capital could only be achieved on the basis of scale and, recognising this, the second Economiese Volkskongres laid out the course of events of the 1950s, O'Meara (1983, pp.281-9):

> A strategy of accumulation based on small undertakings was doomed. Led by the managing director of Sanlam and Bonuskor (Sanlam subsidiary), all the major theoreticians declared that now the volk would have to reserve its assistance exclusively for well-established, large institutions, and in particular those which centralised capital for investment ... no capital would be forthcoming to help develop existing small undertakings. Large-scale Afrikaner commercial undertakings could now only be established on the initiative of, and under the supervision and control of, the investment companies dominated by Sanlam ...

> With the growing differentiation of urban Afrikaners, and particularly with the emergence of two distinct classes out of the economic movement - a small group of financial capitalists and a large, restive, petty bourgeoisie - strong differences over the meaning of the economic movement and what constituted the interests of the 'volk' grew more acute. This was to find its reflection in the nationalist politics of the 1950s and 1960s.

This approach, focusing on large-scale investments was reflected in policies towards industrial development, particularly in the actions of the Industrial Development Corporation (IDC) which resulted in a strengthening of the MEC as is discussed below. While less relevant to the MEC, there were important divisions between the three dominant Afrikaner institutions. Volkskas confined its activities almost exclusively to banking in the 1940s, O'Meara (1983, p.200):

> During this period (1940s) Volkskas' activities were almost entirely limited to banking. Unlike Sanlam it did not yet enjoy a wide network of financial and industrial interests. While its role in centralising capital was vital, this archly conservative bank was not itself in the business of directly investing in industry.

Banking, up until 1960, was dominated by the Barclays and Standard Banks. Their dominance in mobilising national savings was eroded in the 1950s by: a) the growth of the National Finance Corporation (NFC); b) competition from Volkskas, Nedbank and Trustbank; c) competition from building societies and life assurers.

TABLE 4.2 - STRUCTURE OF THE SOUTH AFRICAN FINANCIAL SECTOR

	Commercial Bank Deposits £m	Building Society Deposits £m	Life Assurer Assets £m
1948	156.1	187.8	162.4
1960	376.6	(1959)531.9	(1957)365.4

Source: Jones and Muller(1992).

The phenomenal growth of Volkskas, initially founded in 1934 as a "people's savings bank on a co-operative basis", Verhoef (1992), is illustrated by the rise in deposits relative to other commercial bank competitors, from 2.8% in 1947 to 18.6% by 1967. Most of the growth in deposits came after the election of the National Party in 1948 and resulted from the transfer of the banking accounts of central government, municipalities and state corporations like Iscor, Escom, South African Post Office, South African Railways, Sasol and others.

TABLE 4.3 - DEPOSIT SHARE OF COMMERCIAL BANKS IN SOUTH AFRICA

	Standard %	Barclays %	Volkskas %
1947	47.2	46.2	2.8
1957			9.9
1960	38.0	43.3	
1967			18.6
1977			19.0
1981			18.8

Source: Volkskas data from Verhoef (1992), Standard and Barclays data from Jones and Muller (1992).

However, Volkskas did not venture significantly into financing industrial development until the 1960s, focusing on serving small-scale agricultural interests. In 1965, 83% of its branches were in the platteland

(rural Transvaal and OFS), and this fell to 75% in 1981 when its business "was divided fairly equally between its urban and rural customers", Verhoef (1992).

Sanlam, the life assurance company, on the other hand, was in a position by 1950 to increase its involvement in mining, manufacturing and commerce. Through its industrial arm, Federale Volksbeleggings, it had interests in fishing and canning (Laaiplek Visserye and Marine Production Corporation), agricultural implements (South African Farm Implements Manufacturers), chemicals and pharmaceuticals (Agricultura Laboratoria and Klipfontein Organic Products), coal mining (Klipfontein and Klippoortjie mines) and publishing (Nationale Pers).

As a life assurer or mutual institution, Sanlam was legally restricted in the extent to which it could deploy its life assurance income in production. To overcome this, it separated the bonuses accrued to its policy holders and used newly created Bonuskor in 1946 as an additional industrial investment arm. Bonuskor followed a similar pattern to Fedvolks and by 1950 had invested the bulk of available funds in manufacturing (57%), mining (4%), commerce (21%) and finance (18%). The process of consolidation and concentration continued in the 1950s with a shift of emphasis to mining. In 1953, Fedvolks and Bonuskor merged their mining interests into Federale Mynbou, the forerunner of today's Gencor. By 1957, 23% of Bonuskor's investments were in mining.

The passing of the Regulation of Monopolistic Competition Act of 1955 reflected the tensions between small- and large-scale capital at the time, although it is widely acknowledged that the legislation was ineffective in practice. However, divisions within, and competition between, fractions of Afrikaner capital also mirrored the tensions between the Cape and Transvaal

branches of the National Party, with these surfacing from time to time. For example, Trustbank was set up by Sanlam in 1955 in competition to Volkskas. After the election of Verwoerd, Sanlam and the Cape NP became a focus for opposion to the leadership of the NP. The significance of these divisions were not lost on the Anglo American Corporation (AAC), as will be discussed later.

But not all fractions of Afrikaner capital grew through the financial sector. Rembrandt's growth in the 1950s was sectorally specific, in tobacco, cigarettes and, later, alcohol spirit. Rembrandt initially sprang from within the Transvaal Broederbond faction. In 1953, financed by both Sanlam and Volkskas, Rembrandt bought the Rothmans cigarette mail order company and expanded rapidly thereafter. Rembrandt and its founder, Anton Rupert, became associated with Cape financial power. Its position as large-scale capital was articulated more clearly and openly than any other fraction of Afrikaner capital. In the post-Sharpeville period, together with AAC, it set up the South African Foundation business lobby. In 1977, after the Soweto uprising, again with AAC, it created the Urban Foundation.[3]

The promotion of Afrikaner capital in the late 1940s and 1950s overlapped with the creation of a range of institutions around gold mining, then the central activity of the MEC, and challenged the dominance of British commercial banks in mobilising national capital for industrialisation. The process involved significant interaction between state agencies, "Afrikaner" and "English" capitals. It had three principal components, namely the accommodation of Afrikaner banking institutions by the dominant Standard and Barclays Banks (discussed above), the strengthening of Afrikaner institutions through state patronage and the creation of a long term capital market.

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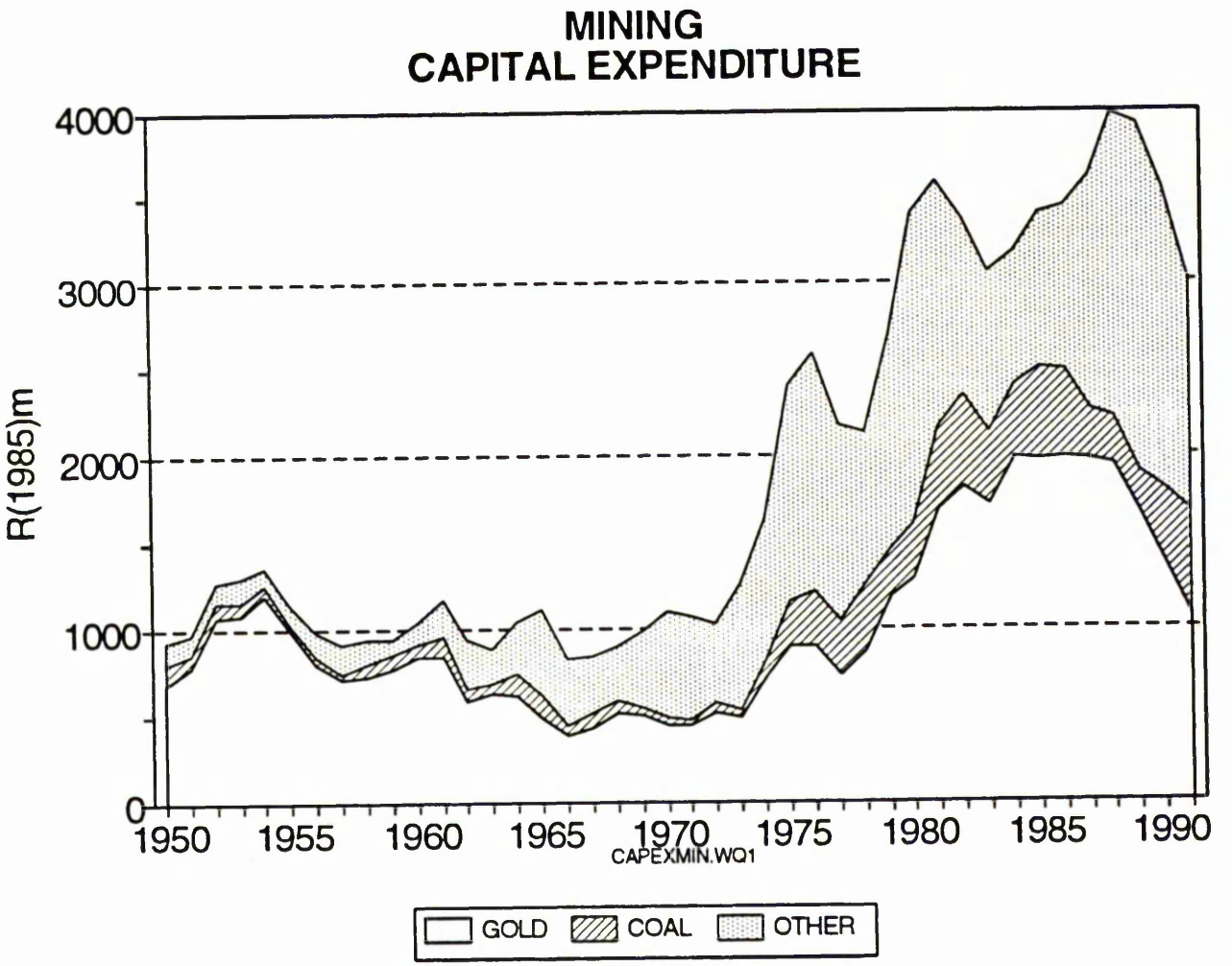
3 For more details see Gerber (1973).

1.2 LONG-TERM CAPITAL MARKET

In 1949, when the National Party created the National Finance Corporation (NFC), short-term funds taken in by commercial banks in South Africa were being re-deposited in London. The NFC provided a local market, investing its deposits in Treasury bills, thus providing an "instrument for channelling short-term funds into the hands of government bodies", Jones and Muller (1992, p.210). Despite drawing in considerable funds, Jones (1992) argues that the NFC did not provide the basis for a successful domestic money market because the demand for short-term loans was rather limited. Unfortunately, Jones' descriptive account overlooks the central role of the MEC. For events in the financial sphere in the post-war period up to 1955 were heavily conditioned by the development of the Orange Free State Goldfields (FSG). Mining and quarrying capital expenditure exceeded R1 billion (constant 1985 terms) for four consecutive years after 1950, and more than 80% of this was related to gold mining, (figure 4.1).

FIGURE 4.1 - MINING CAPITAL EXPENDITURE



Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

The scale of this project cannot be over-emphasized. The recent AAC decision to develop the Moab gold mine, the announcement of the Columbus stainless steel project and the Alusaf II smelter investments, currently welcomed as desperately needed signs of confidence in the economy, all pale into insignificance compared to the FSG development of 12 individual gold mines in a part of the country where supporting infrastructure was virtually non-existent. De Kock (1951) imparts a striking impression of an interplay between state and corporate planning right down to the last compound for mine workers. The sheer scale of the project was even impressive to the chair of the IBRD (now part of the World Bank group), and its £50m loan to the Union government in 1953 for electrification, railways and infrastructure can be taken as a sign of their confidence. The state utilities overcame huge technical problems - water was pumped 40 miles from the Vaal river and, while electricity from the Vaal power station was used initially, Vierfontein station was specially built by state-owned Escom at a cost of £17m in addition to the £370m spent on the 12 mines themselves.

Among its activities, also subscribed heavily to mining house debentures. In many respects, the NFC was a financial intermediary, inter alia channelling profits made from (AAC-owned) De Beers diamond sales into AAC's FSG project. Of the NFC's deposits of £58m in 1958, £21m had been deposited by De Beers, Innes (1984, pp.148-9). Mining houses were able to reduce risks associated with mining investment by taking advantage of the financial intermediary role of the NFC. With the NFC sharing the risks, financing investment in mine development followed a well-lubricated path.

Such funding of the development of the FSG was an important site for the erosion of the disjunctures between economic and political power despite the prevailing political animosities following the 1948 election of the National Party and its re-election in 1952. The benefits of the interplay of interests were overwhelming. Through the NFC, the state profited on the "spread" between deposits and investment. According to Palmer (1958), NFC turnover rose from £70m in 1949 to £1,045m in 1953. Secondly, direct and indirect state revenues from leasing, royalties, company and employee tax were estimated at around 40% of the gold fields' profits. Third, the project transformed the OFS economically and politically. Economically, it promoted a form of regional decentralisation, developing a relatively unpopulated NP stronghold. By 1960, there were 93,000 workers in the OFS, about 20% of the 456,000 employed in the entire gold mining industry. It also raised the white voting population of the OFS thirty-fold over 15 years from 5,500 whites in 1950 to an estimated 146,000 in 1966, thereby increasing the number of parliamentary seats and strengthening the NP.

In 1955, the AAC founded Union Acceptances Ltd (UAL), its in-house merchant bank. It did so with the support of Barclays, one of two dominant commercial banks. Innes (1984, p.182) argues that this was the second stage in its strategy whereby,

> ...first, the state was prevailed upon to make the early running through the NFC (as it were, to test out the market) and only when that venture had proved successful did the Group itself enter the field through UAL.[4]

[4] Innes (1984, p.135) cites Hagart (1967, p.110) who asserts that Ernest Oppenheimer was actively involved in the formation of the NFC.

By 1961, although UAL dominated the merchant banking market, four other merchant banks had been formed including the Sanlam-controlled Central Finance and Acceptance Corporation and the IDC-controlled Accepting Bank for Industry. The NFC with deposits of £69m had been overtaken by private sector institutions, their collectively holding £71m.

The growth in the financial sector's contribution to GDP from 9.5% to 10.7% between 1950 and 1960 is illustrated in figure 4.2. However, the assertion by Innes (1984, p.182), that the structure of capital during the 1950s represented "the clearest form yet of the merging together of bank capital and productive capital - that is, of the emergence of the phase of finance capital", proves a premature and inappropriate dating.[5] For, while Afrikaner capital had grown significantly through the financial sector, it had not acquired a firm and sustainable base within mining or manufacturing industries. The FSG development had been a joint venture between AAC and three other mining houses, none of which was associated with Afrikaner capital.[6] And the significant developments in the financial sector, were not yet followed by any significant diversification out of the MEC.

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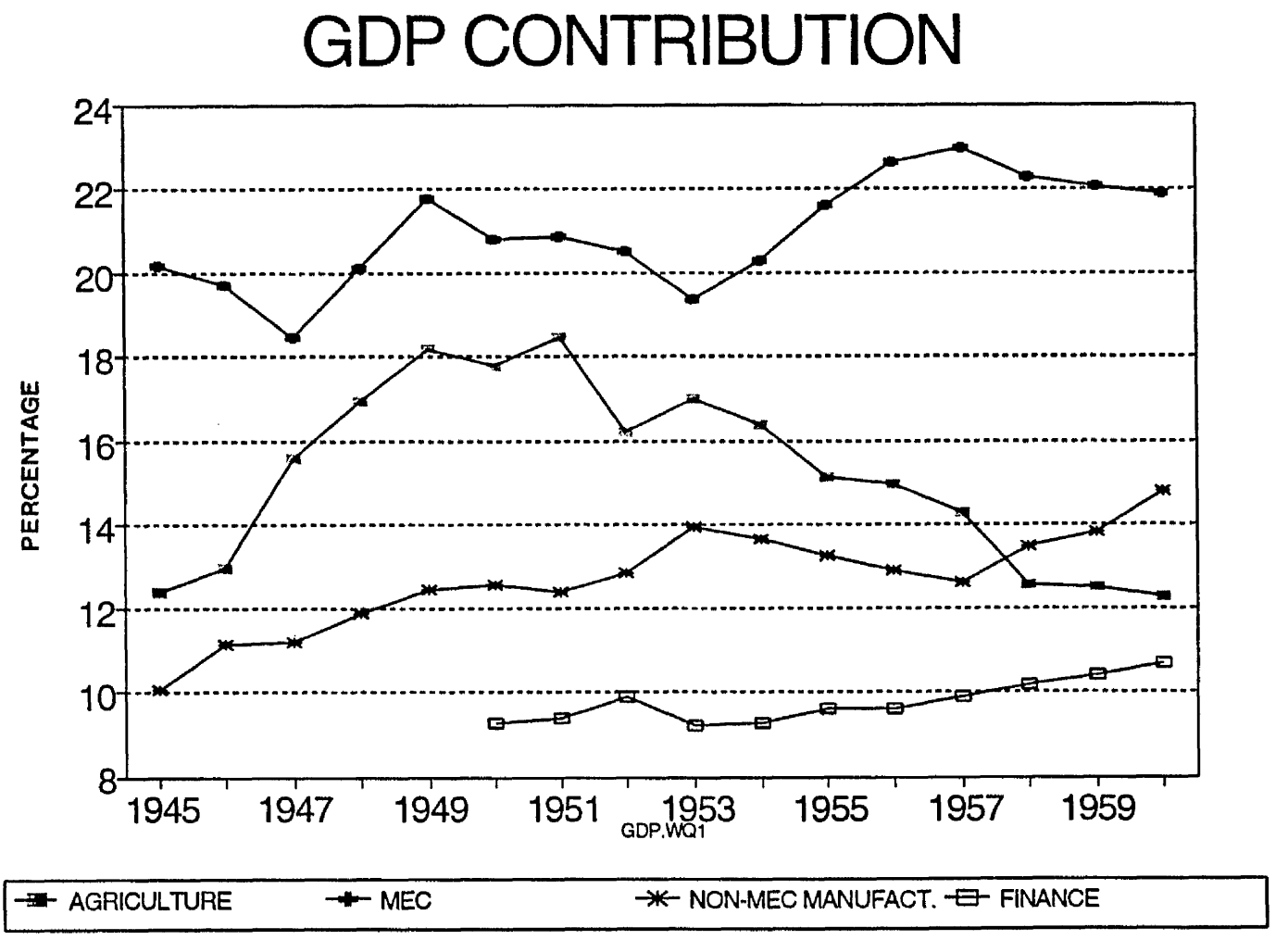
5 Innes refers to King (1962, p.163) who suggests that the UAL was to be modelled along the lines of the UK financial system. Innes seems motivated by the wish to impose concepts, such as finance capital on the South African economy. These are borrowed from the analysis of advanced capitalism, however much valid for that purpose. Here the term finance capital will be used for descriptive purposes only.

6 Innes (1984, p.256) provides the following record of the distribution of ownership of the OFS gold field:

AAC Mines: Western Holdings, Free State Geduld, Welkom, President Brand, President Steyn, Lorraine and Jeannette.
Anglovaal Mines: Virginia and Merriesprult.
Union Corporation: St.Helena.
JCI: Freddies Cons.
Consolidated Goldfields: Free State Saalplaas.
Central Mining: Harmony.
General Mining: Riebeeck.

FIGURE 4.2 - GDP CONTRIBUTIONS, 1945-1960



Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

Sectorally the MEC core includes Mining, Electricity and the following sub-sectors of Manufacturing; ISIC 371 (Iron and Steel Basic Industries), ISIC 372 (Non-Ferrous Metal Basic Industries, ISIC 361,369 (Other Non-Metallic Mineral Products) and ISIC 351-354 (Fertilisers, pesticides, synthetic resins, plastics, other chemicals, basic chemicals and petroleum).

1.3 ERODING DISJUNCTURES IN ELECTRICITY, COAL MINING, CHEMICAL AND FUEL INDUSTRIES

MEC growth dominated industrial development in the 1950s, as the political and economic disjuncture in its component productive sectors gradually eroded. There were two identifiable state industrial strategies which emerged during this process; firstly, the nationalisation of the electricity industry and a corresponding power station construction programme and, secondly, the creation of a state-owned fuel-chemical industry. Both of these policies were implemented through a mixture of collusion and competition with English capital. While state provision of energy and transport infrastructure was essential for mining, the process of provision implicitly included state patronage for Afrikaner industrial concerns which, supported by burgeoning Afrikaner finance, were propelled into several key industries around the MEC.

The role of the energy component of the MEC was most prominent in the 1950s through its impact on other sectors. The electricity industry had been set up in the 19th century by the mining industry and was taken over by the state in 1948, with AAC assisting with financing. At the time, about 59% of generated power was consumed in the (mainly) gold mines, Christie (1984, p.128). Uncertain of their future prior to state takeover, the private power generators did not invest in new capacity, and the demand from the OFS gold fields together with increasing post-war industrialisation in the early 1950s led to periodic power shortages. The lack of sufficient railway trucks and locomotives during that period constrained the movement of goods, particularly bulk coal from mines to urban power stations and urban consumers. Coal exports were also constrained by the lack of transport.

Coal mining at the time was dominated by the major "English" mining houses represented by the Transvaal Coal Owners Association (TCOA), a cartel that effectively controlled access to the domestic market. Controls on the pithead price of coal, in existence in the post 1948 period, encouraged exports at the expense of the local market, Christie (1984, p.151):

> The average cost of coal at the pit's mouth at 7s 4d per short ton, compared with 45s in Britain, France and Germany, 65s in Belgium, 34s in the US, 36s in Canada and 17s per short ton in Australia.

An indication of the lucrative nature of exports at the time is that, while only 7.5% of total mined coal was being exported, it contributed 46% of coal mine profits. Frustrated by the "closed shop" of the TCOA, the coal mines owned by Sanlam found other means to further their interests by influencing the Department of Commerce and Industry to allocate scarce rail trucks and export licenses independently of the TCOA cartel. This strategy was fuelled by the ideological debates of the period, with the "English" TCOA being publicly blamed for the coal shortages, the (slightly misleading) argument being that they were making excessive profits from export coal which could be made available on the domestic market.

Coal rationing was introduced in 1952, with the TCOA giving first claim on supplies to state railways, the central state, municipal and mine power stations and gold mines. With these priorities, black consumers suffered the most from fuel shortages. With its re-election in 1952, the National Party ensured continuing support to Afrikaner capital and, by 1954, TCOA was forced to admit two Afrikaner coal owners into the cartel. New power stations were being constructed, and the coal supply contracts were increasingly being awarded to

Afrikaner-owned coal-mines. Federale Mynbou's Coalbrook colliery supplied the new Taaibos and Highveld stations. However, overall, Afrikaner capital was still on the fringes of such activity. The major problem of the 1950s was in meeting the power demand of the gold mines, and this was ultimately resolved by 1960 through the building of three power stations on the coal fields themselves, thus circumventing the need to transport huge quantities of coal around the country.

The construction of new power stations strengthened the MEC, but it was constrained by a lack of capital and machinery. Even when power station construction was approved, Korean war demand mopped up supplies of imported power generation equipment. To some extent, this was countered by the strategic needs of the United States for South African uranium. The US Export-Import Bank provided a £7m loan in 1952 for US equipment, thus facilitating the construction of the Wilge station. Enormous long term loans were raised in the 1950s, mainly through the World Bank, for power plant (1950: $30m and 1954: $30m) and railway infrastructure (1950: $20m and 1954: $30m). In 1950, a further $10m was raised from eight US commercial banks, who also raised $20m to finance mining equipment for the OFS mines. By 1960, the Vierfontein (360MW), Taaibos (480MW) and Wilge (240MW) stations had been built and the Highveld (480MW) station was under construction. New capacity totalled 1560MW, a huge increase compared to 1950 capacity of 1290MW, Escom Statistical Review (1990). Of the £105m of long term liabilities raised by the Union Government in the 1950s, Union Statistics for Fifty Years (1960, U3), more than half (£58.5m or $117m) was incurred before 1955, specifically for energy and railway infrastructure. Macroeconomic balances were then significantly affected by the investment demands of the MEC.

In the 1950s, a second conscious industrial strategy by the state was the development of an indigenous fuel-chemical industry. This coincided with the expansion of the existing chemical industry which was heavily dependent on demand from the mining industry and which had long been dominated by the AAC subsidiary AECI. Most of AECI's capital expenditure in the 1950s was aimed at increasing ammonia production for the explosives required by the new OFS gold mines. While diversification did take place - the SAICCOR Rayon plant joint venture with the IDC in 1954, PVC in 1955 and expansion in fertiliser production, for example - most chemical production served the mining industry.

The construction of the Sasol I oil and chemicals-from-coal plant was a substantial bolster to the MEC. An indication of its impact on the chemicals sector and on the state budget was its cost - about £40m between 1950 and 1956 when it began producing, IDC Annual Report, 1956. In comparison, this was almost double the total authorised capital (£23m in 1956) of the dominant producer AECI, and it dwarfed AECI's ammonia plant expansions between 1958 and 1960 which cost £10m, Cartwright (1964).

The IDC, set up in 1940 to encourage secondary industrialisation, was heavily involved in developing the synthetic fuel and chemical industries. Table 1.5 provides an indication of the focus of its attention in industrial sectors associated with the MEC. By 1956, the IDC had invested £40.7m in Sasol, representing 77% of its total investments in industry.

These and subsequent IDC interventions have contributed significantly to the growth of the MEC core. The IDC historically chose to finance the establishment of infant industries which largely fell within the non-mining sectors of the MEC, including phosphates (1952),

Palaborwa copper (1963), coal-based chemicals; Sasol I (1951), synthetic rubber (1962), Soekor oil exploration (1965), Alusaf aluminium smelter (1967), industrial chemicals (1967), Sasol II (1976), Sasol III (1979) and Mossgas (1986).

While the IDC promoted other industries, including armaments such as Atlas Aircraft Corporation (1964), most resources have been deployed to promote the MEC, (table 1.5); 68.3% in 1960, falling gradually to 37.4% in 1980 and rising to 48.0% in 1985.

The upward trend since 1980 is set to continue. The IDC has indicated that its next targets include steel and stainless steel beneficiation, wood pulp, chemicals and petrochemical products.[7] Simultaneously, the IDC (1990) is proposing to reduce tariff barriers which have protected large segments of non-MEC industries. Thus, that component of past industrial policy which involved tariff protection is simply being put into reverse, without the addition of other policy tools.

In summary, by 1960, the boundaries of the MEC had been substantially broadened (a process that was to continue subsequently). In sectoral terms, it encompassed mining, mineral processing (mainly steel at the time), electricity, chemicals and liquid fuels. GDP contributions from these sectors rose from 18% in 1953 to 21.5% by 1960, while non-MEC manufacturing continued to fluctuate between 14-15%, (figure 4.2).

As a system of accumulation, the MEC represented the means by which Afrikaner fractions of capital sought to involve themselves in mainstream economic activity. While the 1950s saw Afrikaner capital consolidate its position within the financial sector and gain footholds in the coal mining and fuels-chemical sectors as a junior

7 Financial Mail 17-5-91.

partner, the 1960s would witness its much wider sectoral penetration of the economy, mainly within the core MEC sectors, and with an increasing interaction between itself and English capital.

2. THE INTERPENETRATION OF ENGLISH AND AFRIKANER CAPITAL IN THE 1960s

The erosion of the disjuncture between English and Afrikaner capital was spurred on by foreign capital withdrawal after the Sharpeville massacre in 1961. It resulted in the interpenetration, firstly, of English and Afrikaner capital and, secondly, of different fractions of Afrikaner capital. However, the erosion was insufficient to support significant industrial diversification out of the MEC, which dominated economic activity and continued to determine the pattern of industrial development. This process was accompanied by increasing state-led investment in the MEC, around energy, chemicals, processed minerals and armaments. Thus, as the direct contribution of mining to the economy fell from 13.7% of GDP in 1960 to 8.8% in 1971, the contribution to GDP of non-mining MEC sectors rose from 7.9% to 8.5%, (figure 4.6).

The share of Afrikaner ownership of the mining sector increased significantly in the 1960s. Initially, these were served by coal contracts from the growing state electricity giant, Escom, (table 4.4). Of the five stations commissioned in the 1960s, four coal contracts were awarded to Sanlam's Federale Mynbou, whose coal interests were subsequently placed under the Trans-Natal Coal subsidiary, TNC. By 1962, Federale Mynbou was the second largest coal company in the country, after AAC.

TABLE 4.4 - ESCOM COMMISSIONING SCHEDULE

COAL-FIRED STATIONS	LOCATION	RATING MW	MINING HOUSE	FIRST SET	LAST SET
KOMATI	Middelburg	1000	TNC	1962	1966
INGAGANE	Newcastle	500	TNC	1963	1969
CAMDEN	Ermelo	1600	TNC	1967	1969
GROOTVLEI	Balfour	1200	AAC	1969	1977
HENDRINA	Hendrina	2000	TNC	1970	1977
ARNOT	Middelburg	2100	AAC	1971	1975
KRIEL	Bethal	3000	AAC	1976	1979
MATLA	Bethal	3600	TNC/GFSA	1979	1983
DUVHA	Witbank	3600	RM	1980	1984
LETHABO	Vereeniging	3708	AAC	1985	1990
TUTUKA	Standerton	3654	AAC	1985	1990
MATIMBA	Ellisras	3325	ISCOR	1987	1991
KENDAL/KHUTALA	Kendal	686	RM	1988	1993
MAJUBA	Volksrust	0	RM	1996	2001

Source: Escom (1990).

With the exception of a few large and lumpy investments, mainly in MEC sectors, diversification out of mining took place through acquisition rather than through new investments. Federale Mynbou diversified into asbestos in 1962 through the acquisition of Msauli and Gefco. The outflow of foreign capital after the Sharpeville massacre in 1961 provided the opportunity for Afrikaner and English capital to buy into existing concerns. The AAC, flush with cash from the OFS gold fields, began a pattern of domestic and international acquisitions that has continued unabated. In 1958, AAC took control of Central Mining, subsequently placing it under a London-based subsidiary, Charter Consolidated. In 1962, Charter took control of the Hudson Bay Mining and Smelting Company in Canada at the same time that AAC was blocking Federale Mynbou's bid for control of JCI, by taking over JCI itself. There were two reasons for this, Innes (1984, p.158). First, JCI had substantial holdings in De Beers and the Diamond Producers' Association. Second, JCI controlled Rustenburg, the world's largest

platinum mine and also had substantial copper mining interests. Clearly, uncontrolled interpenetration of Afrikaner interests in AAC's sphere of influence was not welcome.

TABLE 4.5 - DOMINANT MINING & INDUSTRIAL GROUPS IN SOUTH AFRICA, 1960-1970

	1960 Market Capitalisation £m	1970 Ultimate Controller
Anglo American Corporation	87.3	AAC
JCI	15.1	AAC
Rand Mines	12.7	AAC
Central Mining	15.5	AAC
General Mining	15.3	Sanlam
Union Corporation (1)	32.8	Sanlam/Rembrandt
Anglovaal	5.7	Hersov/Menel
Goldfields	33.7	Goldfields

Source: Innes (1984,p.165).

(1) General Mining took control in 1975.

Thus, the acquisition in 1964 of General Mining by Federale Mynbou, with the help of AAC, signalled a conscious accommodation of Afrikaner by English capital, or compromise in the face of conflict. It is no coincidence that the assistance given to Federale Mynbou followed the setting up of a Commission of Inquiry into the affairs of the AAC in 1964 as a result of lobbying by the largely Transvaal-based, Afrikaner petty-bourgeois fraction of the NP. Innes (1984, p.158) argues that, "participation for Afrikaner interests in one of the main gold mining groups was a way in which these criticisms might be muted." However, the growing accommodation with English capital increased the strains on the NP alliance and, as O'Meara (1984, p.251) observes:

> Initially this took the form of regionalism. Attacks on the geldmag (financial power) of the

> Cape - on Sanlam and Rembrandt - gathered force in the 1950s. By the time of Sharpeville, these divisions were explicit ... Throughout the early 1960s ... the Cape party, its organ Die Burger, and the Sanlam interests were virtually an official opposition within the NP. With the assassination of Verwoerd in September 1966, this conflict burst into open struggles between so-called verligtes (the enlightened) and verkramptes (the reactionaries). In 1969, the leading verkramptes were expelled from the NP and ... they formed the Herstigte (reconstituted) National Party.

By end of the 1960s, while Afrikaner capital had made inroads into the mining industry, AAC still dominated gold mining through its own mines and through control of JCI, Rand Mines and Central Mining. Interpenetration was evident through the minority holdings AAC held in General Mining, Union Corporation and Goldfields, (table 4.5).

Clearly, given the political strains outlined above, and despite the erosion of the disjuncture, it was still not possible for the state to adopt industrial strategies to diversify out of the MEC. Instead, the policies adopted in the 1950s, through state corporations and joint ventures between the IDC and private capital in and around the MEC, continued to provide the main impetus to industrial development.

Although the manufacturing sector is generally acknowledged to have grown significantly in the 1960s, most of the expansion was, as it had been throughout the post-war period, associated with large, lumpy investments in the MEC. A considerable portion of manufacturing sector fixed investment in the 1960s was concentrated in MEC sectors like steel, chemicals and processed minerals,

rising from 35.5% to 49.8% of manufacturing fixed investment between 1961 and 1972, (figure 4.3).

For much of the decade of the 1960s, the iron and steel sector absorbed more than a quarter of all annual fixed investment in the manufacturing sector, (figure 4.4). Specific investments in the steel industry included, in 1964, the AAC-owned Highveld Steel and Vanadium plant costing R127m (compared to total 1964 manufacturing sector fixed investment expenditure of R241m). Highveld prompted a second round of investment as AAC vertically integrated its steel and engineering activities, Innes (1984, p.195). Scaw Metals, a speciality steel producer was also acquired in 1964 and by 1969 had assets of R40m.

The ferrochrome industry was created in 1964 by RMB Alloys, a subsidiary of Rand Mines using local chromite ore. This was followed by the Southern Cross Stainless Steel plant, built in Middelburg with IDC assistance between 1964-65. However, the state-owned primary steel maker, Iscor, still remained the major producer and investor in the sector.

In the mineral processing sectors, large investments were made in the Alusaf aluminium smelter. Construction of Alusaf began in 1967 and came into production in 1971 with 53,000t/a (ton per annum) capacity. The plant's R59.5m cost in 1970 compares with total 1970 manufacturing sector fixed investment expenditure of R371.8m. Increasing interpenetration and collaboration is evidenced by the fact that Alusaf was a joint venture between the state, domestic English and transnational capital, involving the IDC, AAC-controlled Rand Mines and Alusuisse. The project included an additional aluminium rod plant, Alustang, a joint venture between Alusaf and state-owned Iscor subsidiary, USCO.[8]

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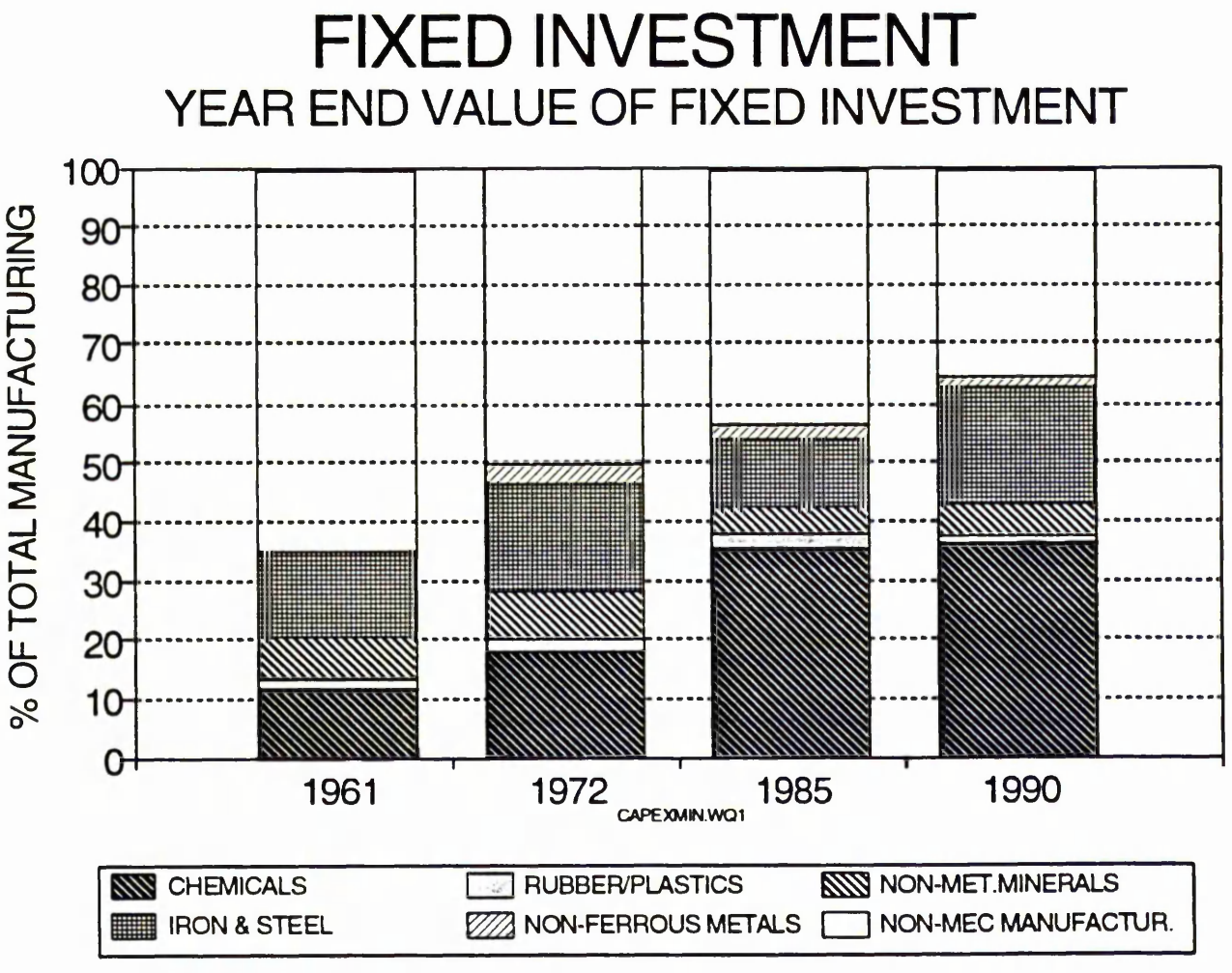
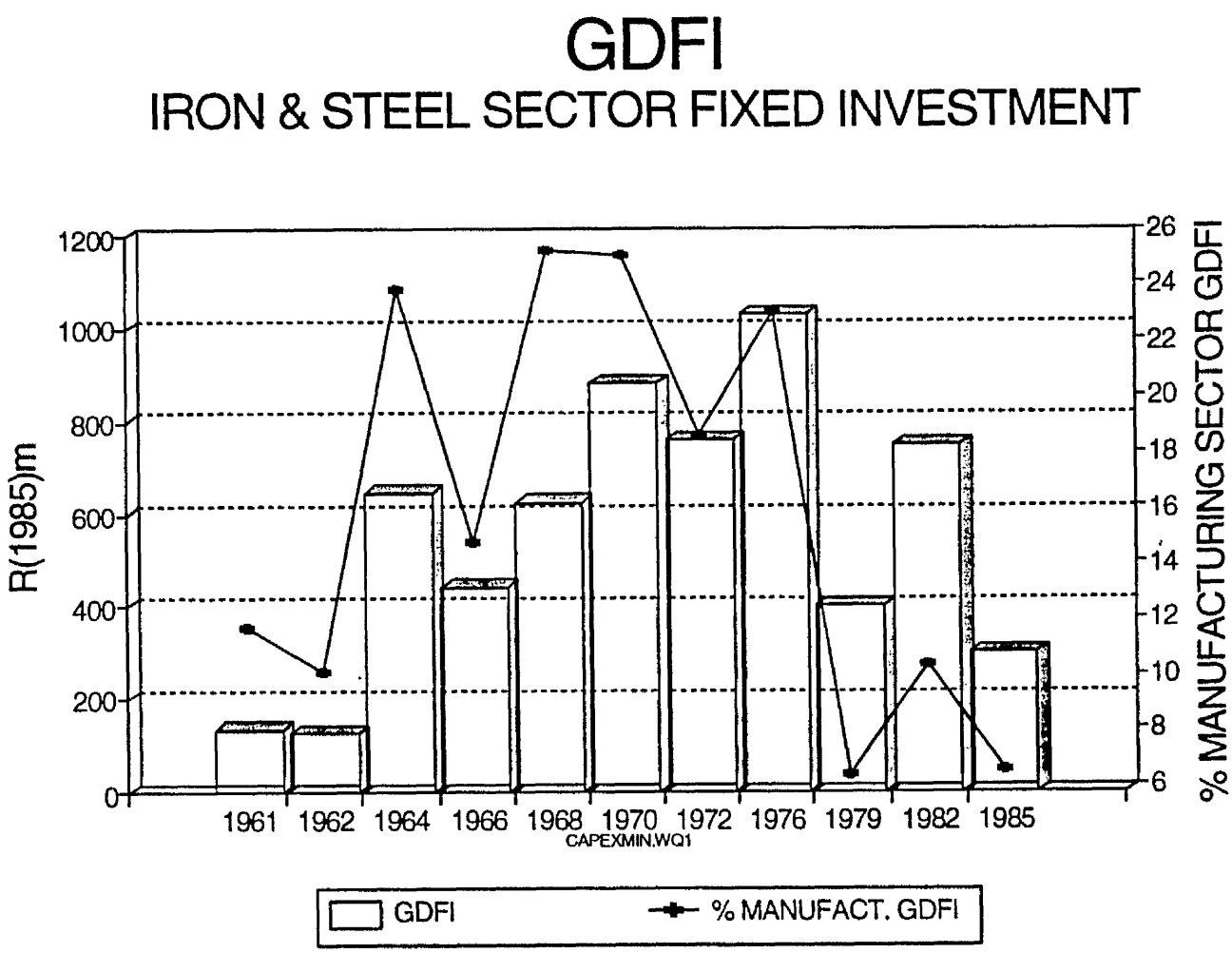
8 IDC Annual Report, 1970

FIGURE 4.3 - MEC FIXED INVESTMENT AS % OF MANUFACTURING, 1961-1990



Source: South African Statistics (1990), IDC (1992).

FIGURE 4.4 - GDFI IN IRON AND STEEL BASIC INDUSTRIES, 1961-1985



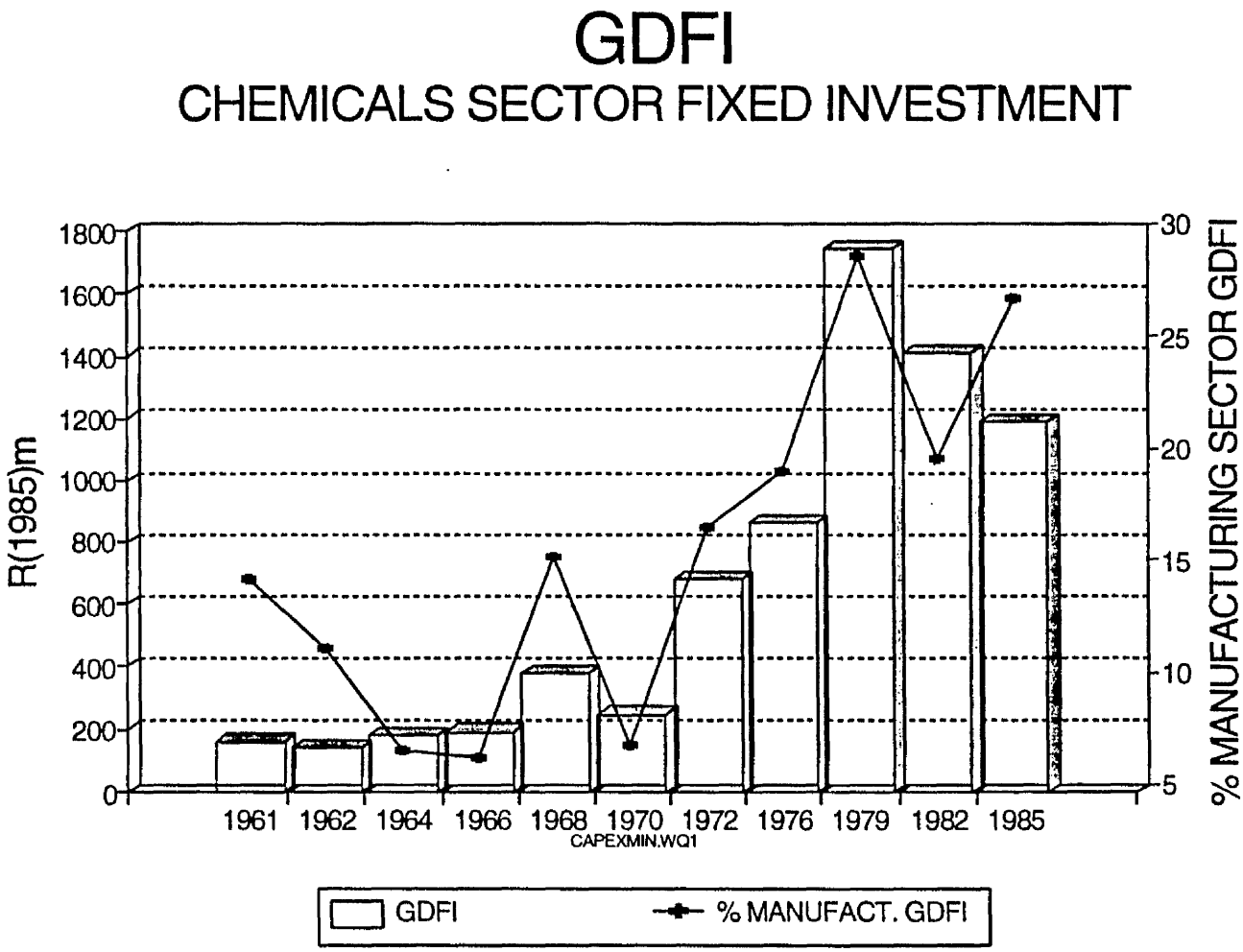
Source: South African Statistics (1990).

The chemical industry was also an avenue through which Afrikaner capital grew and interpenetrated with English capital. In 1960, apart from Sasol and Klipfontein Organic Products, chemical production was dominated by the AAC subsidiary AECI and by transnational oil companies. Economies of scale prompted early integration at Sasolburg, with a polythene plant joint venture between AECI and Sasol. In 1964, the South African Nylon Spinners (SANS) plant was built. In 1966 AECI spent R80m on a petrochemical complex at Sasolburg (compared to a total for manufacturing sector fixed investment expenditure of R386.5m in 1966).

Afrikaner capital furthered its investments in chemicals with the assistance of the IDC. In 1964, a synthetic rubber plant was set up by the Fedvolks subsidiary Karbochem and the IDC. In 1967, the Sanlam subsidiary, Sentrachem, absorbed Karbochem, KOP and the UK Distillers Corporation subsidiary, National Chemical Products (NCP). This newly-formed Afrikaner-owned chemical giant formed an association with Hoechst of Germany in 1969, and expanded into polyethylene. The Natref inland crude oil refinery was built between 1968-1971 and was a joint venture between initiators IDC, the National Iranian Oil Company and the Compagnie Francaise de Petroles. Domestic investors invited included Rembrandt, Volkskas and SA Mutual. The magnitude of chemical sector investments in the 1960s, though less than in the 1970s, were significant, (figure 4.5).

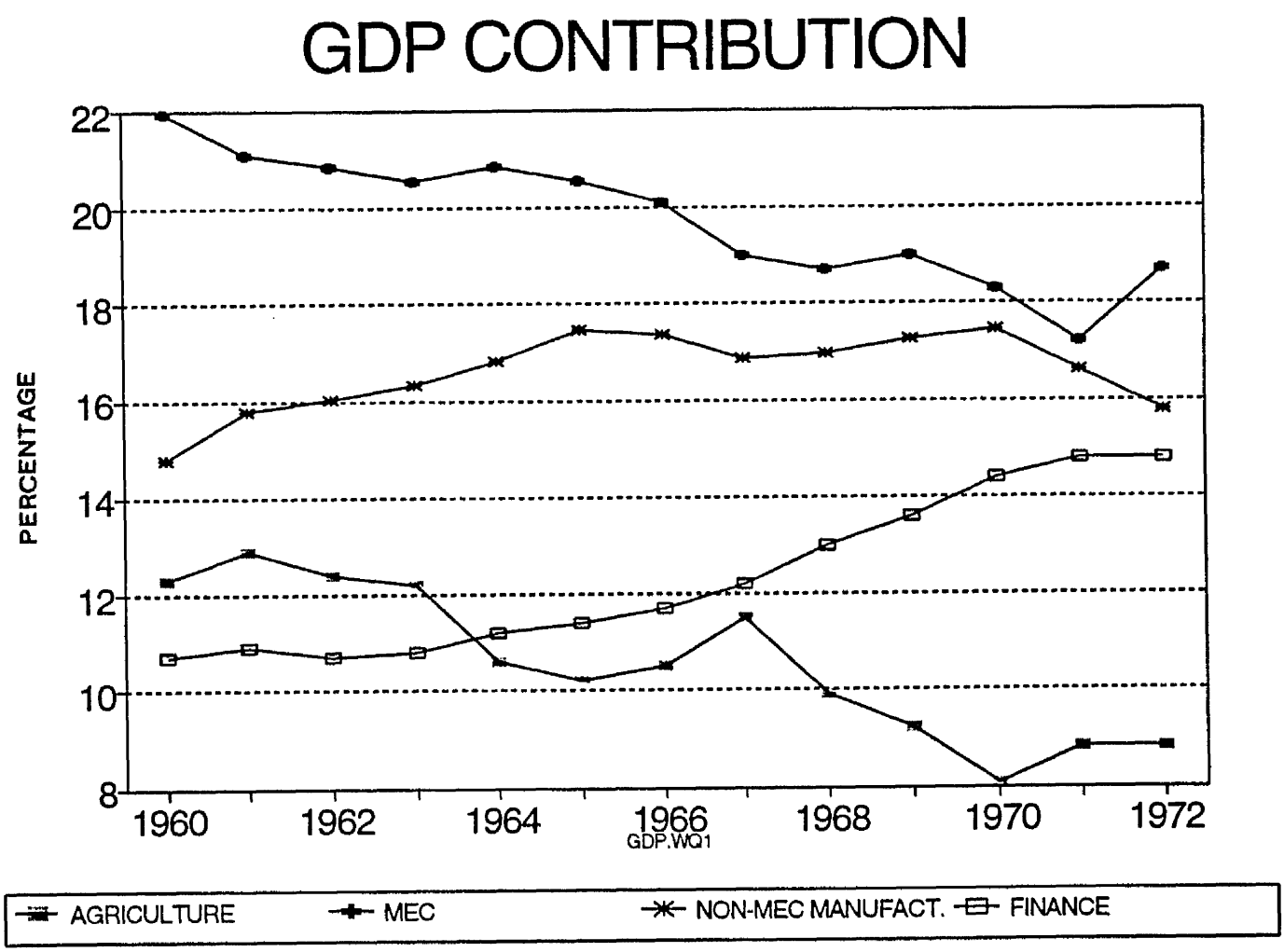
The imposition of an international arms embargo in the early 1960s provided other manufacturing opportunities for Afrikaner capital. Again the IDC's assistance in the formation of Armscor subsidiaries such as Atlas Aircraft Corporation in 1964 was invaluable.

FIGURE 4.5 - GDFI IN CHEMICAL INDUSTRIES, 1961-1985



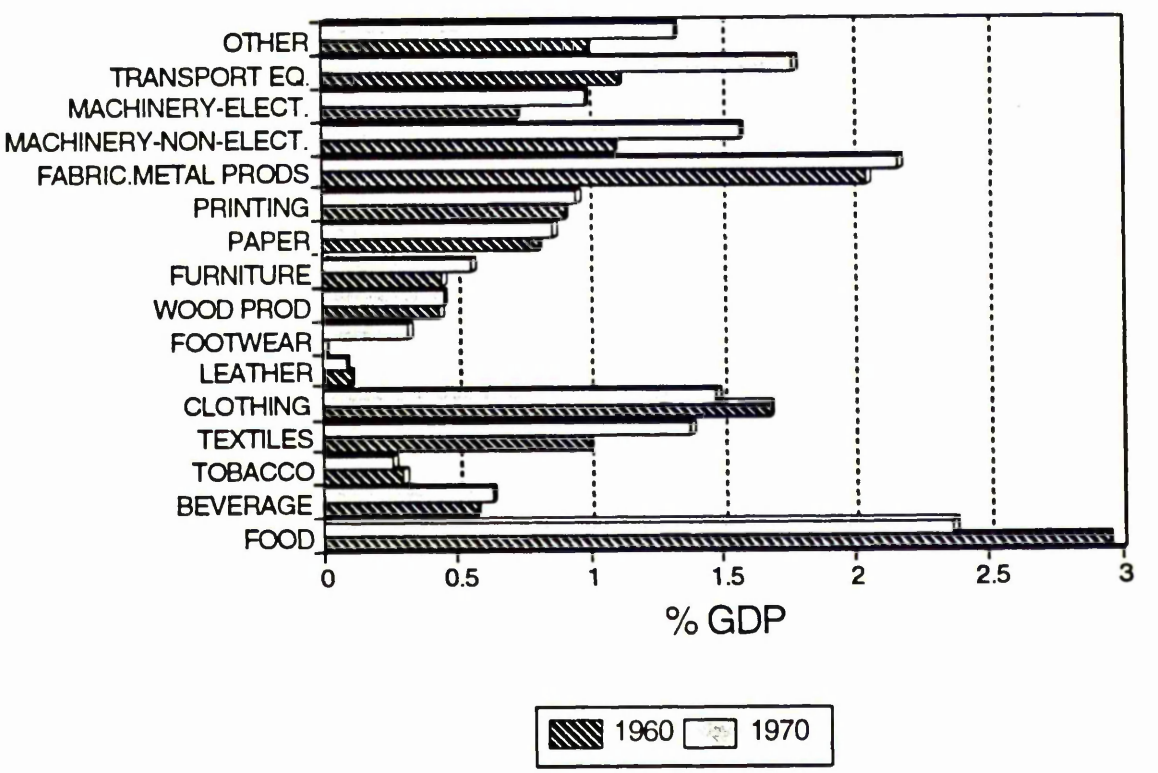
Source: South African Statistics (1990).

FIGURE 4.6 - GDP CONTRIBUTION, 1960-1972



Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

FIGURE 4.7 - GDP CONTRIBUTION OF NON-MEC SECTORS, 1960-1970



Source: South African Statistics (1990).

(1) Transport Equipment here includes the motor industry.

The emphasis on the MEC does not detract from attempts made during this period, or any other period for that matter, to diversify out of the MEC. However, such efforts were not extensive. Between 1960 and 1970, the GDP contribution of non-MEC manufacturing sectors rose from 15% to 17.5% and then fell below 16% in 1972, (figure 4.6).

This non-MEC growth can be attributed to the motor industry (0.6% GDP directly) and, to a lesser extent, the textile industry (0.4% GDP). In the case of the motor industry, many commentators have cited the local content programme, initiated in the early 1960s, as providing a boost to the manufacturing sector.[9] The evidence, presented in figure 4.7, indicates that the impact has perhaps been exaggerated, relative to the MEC. Apart from the direct growth in GDP contribution of about 1.8%, the motor industry would have stimulated growth in the Fabricated Metal Product sector and in the Non-Electrical Machinery sector. While the latter two grew, respectively, to 2.2% and 1.6% of GDP, they are equally likely to have been stimulated by the impact of large-scale MEC projects during this period.[10]

In the case of textiles, growth during the 1950s was partly encouraged by, now discredited, apartheid decentralisation policies.[11] By the early 1960s, the lessons of this experience were abundantly clear to the IDC, the creator of the industry in the 1950s.[12] However, the linkage effects created by the new SANS nylon plant in 1964, provided a boost to the downstream textile industry, (figure 4.7).

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9 The IDC provided direct support by forming Wispeco, a joint venture with Australian Repco, to manufacture motor components.

10 See chapter 6 for a discussion of linkages between the economy and fabricated metal and machinery industries falling within the ISIC 3800 category.

11 See Clark (1987, p.335)

12 See van Eck cited by Gerber (1973, p.113) and also thesis Chapter 5, Section 1.3, page 229.

Adopting a more historical perspective, non-MEC manufacturing's GDP contribution grew from about 4% in 1924 to above 15% in the early 1950s and it has fluctuated around that figure ever since, (figure 1.6). In contrast, a conventional, and false, perspective is that manufacturing's GDP contribution grew from 7.5% in 1924 to 26% in 1990, (figure 1.1). In the 1960s, the financial sector grew rapidly, its GDP contribution rising from 10.8% in 1960 to 14.9% in 1971, (figure 4.6). This was partly due to the role played by this sector, particularly by newly formed merchant banks, in channelling profits from mining into acquisitions of, and investments in, MEC and non-MEC manufacturing sectors.

In conclusion then, and without detracting from their importance, non-MEC manufacturing industries as a whole did not in the 1960s acquire an independent momentum from the weight of activities within the MEC, nor were the institutional conditions favourable to the adoption of policies to achieve such an objective. With the rise in gold and energy prices in the early 1970s, the possibility of this receded even further.

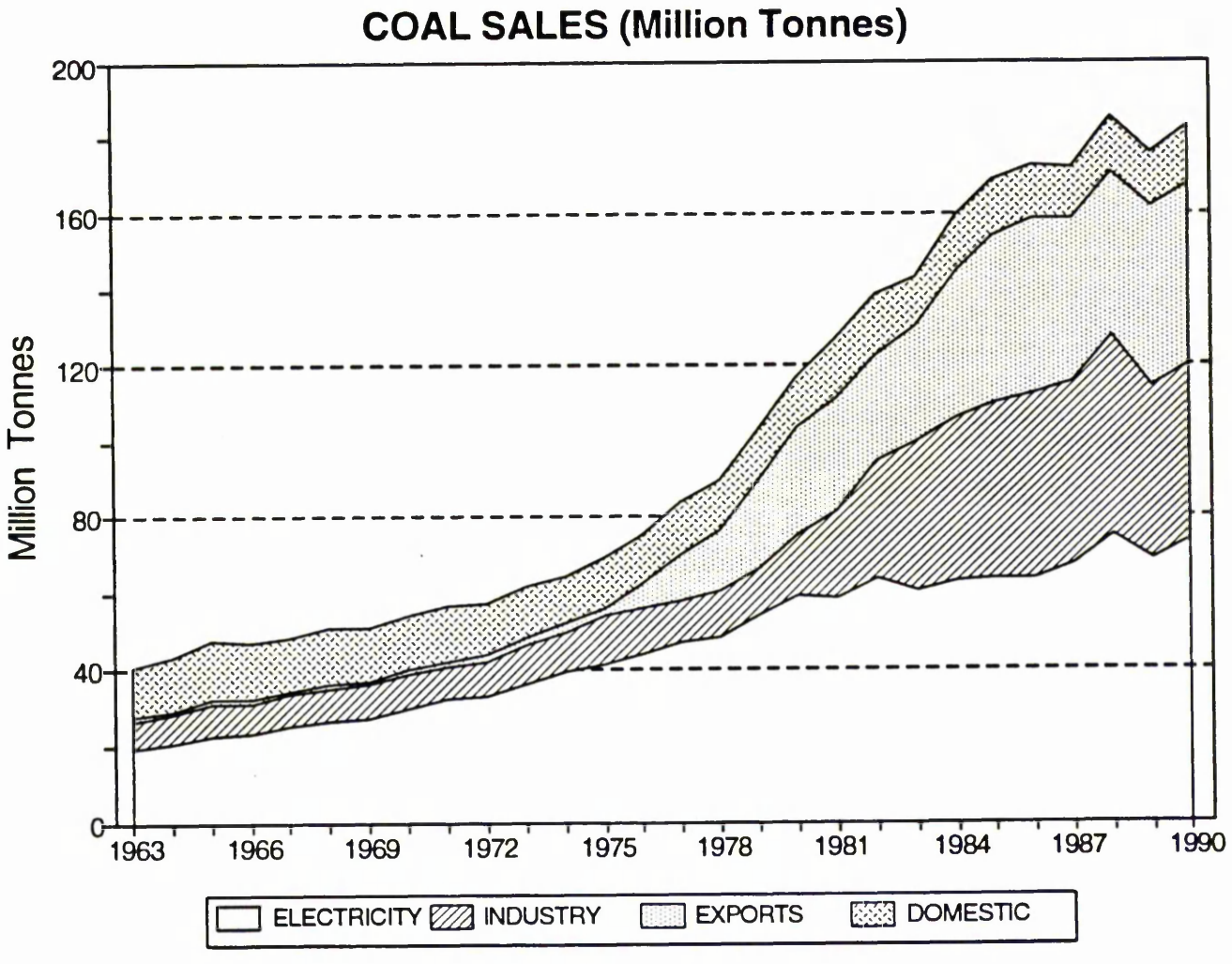
3. MEC EXPANSION IN THE 1970s

The erosion of the disjuncture between English and Afrikaner capital allowed the state, for the first time since the 1950s, to adopt coordinated industrial policies. These revolved primarily around the MEC, following the gold and energy price rises in the early 1970s but coordination was uneven, varying across sub-sectors. In contrast to previous periods, a significantly greater degree of co-operation was evident between private capital as a whole and the state.

A far greater degree of both competition and interpenetration between large-scale English and Afrikaner capital was evident which strengthened private capital as a whole. The emergence of six corporate "axes" of private capital by the early 1980s, signalled the metamorphosis of the historic disjuncture. Each "axis" consists of a conglomerate with extensive but varying interests in the mining, manufacturing and the financial sectors. Each sector is oligopolised by the conglomerates, and that dominance is reproduced through simultaneous control of the financial sector, see chapter two.

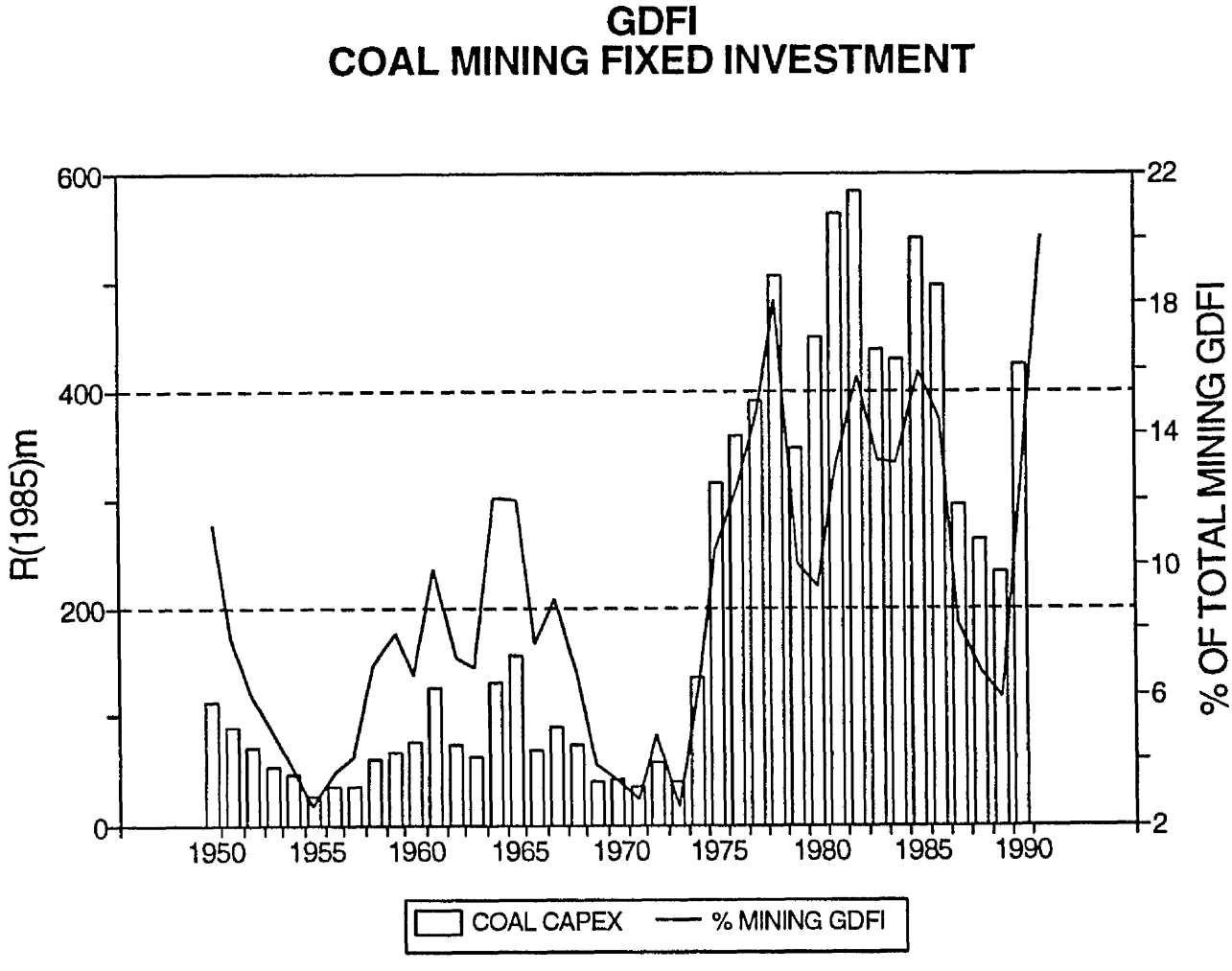
In the 1970s, MEC industries benefited from both booming commodity prices and stable and conducive relations governing the profitability of internal markets. Non-MEC industries, while playing a supportive role to MEC mega-projects, either as suppliers of inputs and capital goods or as consumers of intermediate goods produced by the MEC core, were partly boosted by military demand during the Angolan war in the 1970s, and partly cushioned by conglomerate ownership and by tariff protection.

FIGURE 4.8 - COAL PRODUCTION, 1963-1990



Source: South Africa's Mineral Industry Yearbook (1992).

FIGURE 4.9 - GDFI IN COAL MINING, 1950-1990



Source: South African Statistics (1990).

Perhaps the best example of state coordinated policies and the eroding disjuncture between English and Afrikaner capital is found around coal utilisation; firstly, in the expansion of Escom power generation and, secondly, in the development of the coal exports through Richards Bay. Coal output grew rapidly from the early 1970s, driven by electricity demand, demand from the Sasol II and III plants and coal exports, (figure 4.8).

Through the patronage of Escom contracts, General Mining's Trans-Natal Coal had become the largest single producer of coal in South Africa by the early 1970s. Subsequent Escom contracts were integrated within broader policies for the development of the (then fragmented) coal industry as a whole. This led to the coal industry's consolidation and modernisation around three major groups; AAC's Amcoal, General Mining's TNC and Rand Mines' Randcoal.

The coal export industry could not have developed without such closely coordinated policies which facilitated the pooling of large-scale resources. At the time, the Transvaal Coal Owner's Association (TCOA), of which TNC was an important member, entered into a long term coal supply contract with Japanese steel producers, and subsequent negotiations with the state and the development of coal export policies resulted in enormous state and private sector capital investments. Capital expenditure in the coal industry averaged more than 13% of mining investment for most of the period between 1975 and 1988, (figure 4.9). The state developed infrastructure to facilitate rail transport of coal from the developing Eastern Transvaal coal fields to Richards Bay, ensuring that the harbour would be developed to accommodate large coal carriers. The TCOA undertook to develop the mines and to build, maintain and operate the coal loading terminal. Thus, the MEC was both the most

important site of accumulation and the platform from which the economy was propelled in the 1970s (and on which it faltered in the 1980s).

Perhaps the most decisive industrial policy since the formation of Iscor was the decision by the state to build Sasol II and III. These plants, built with considerable assistance from the IDC, came on stream between 1979 and 1983 and further enhanced the role of the MEC within the economy. Sasol's output of approximately 50% of domestic liquid fuel consumption was forced upon the existing transnational oil refiners, who were compensated through a secret agreement that continues to regulate the fuels industry in 1993.

The disjuncture between English and Afrikaner capital in the chemicals sector did not fade to as great an extent as in others. The construction of the Sasol plants assisted the erosion in downstream chemical processing. It provided new and stable sources of raw materials which could be further processed within a policy framework that would protect downstream investment, the latter requiring enormous commitments of capital which could only be secured through the pooling of resources. In 1979, for example, Sentrachem formed a joint venture with AECI, to produce PVC from coal at the Coalplex plant in Sasolburg. On the other hand, the Sasol project partly undermined coordination and further development of the chemicals industry in the 1980s(see below).

By the 1970s, Afrikaner capital was also confidently reorganising other important sections of the mining and manufacturing industry, although not without favourable assistance from state institutions. Clark (1987) incorrectly interprets this reorganisation as state-led, by the IDC. Acquisitions of fragmented chrome mines in the early 1970s were consolidated and recapitalised

leading to the development of the ferrochrome industry on a large scale.

After embarking on a joint venture with Union Carbide, which led to the construction of the Tubatse Ferrochrome smelter, Genmin took control of its main rival Samancor in 1984 in controversial circumstances. Samancor, formed by a merger between South African Manganese and AMCOR in 1975, was controlled by Iscor(39.6%) with AAC as the largest private shareholder and Gencor as a smaller partner (7%). In 1977, both AAC and Genmin bid for Iscor's 40% share but each was blocked by the state. In 1983, Genmin instituted a R120m court case against Iscor on a coal supply contract at the tied Hlobane colliery where Iscor was demanding reductions in supply. To resolve this, in June 1983, Iscor exchanged 50.25% of AMCOR (which controlled its share of Samancor) for Hlobane and 70% control of Dunswart Steel despite the fact that AAC would have paid more for the stake. In June 1984, Samancor bought the remainder of Iscor's share.

Several other manufacturing industries within the MEC core grew in the 1970s including aluminium, titanium and platinum smelting. Alusaf's capacity was doubled in 1974 and a further expansion was carried out in 1983 by importing an entire mothballed Japanese smelting plant. The titanium smelting operation at Richards Bay was initiated in 1972, as a joint venture between the IDC, Genmin, SA Mutual and QIT of Canada (a subsidiary of mining conglomerate RTZ).

While large-scale English and Afrikaner capital were increasingly entering into joint activities, they competed in the scramble for acquisitions in order to accrue scale advantages. In 1975, General Mining acquired control over the Union Corporation in circumstances which characterised emerging relationships between conglomerates. In 1974, Gold Fields of South Africa

(GFSA) announced a takeover bid for Union Corporation, then one of the largest "independently-owned"[13] mining houses. Previous interpenetration had resulted in AAC and General Mining (Genmin) having, respectively, 10% and 7% strategic stakes in the company, AAC holding 10% through London-based Charter Consolidated. To complicate matters, AAC also held a strategic stake in General Mining.

Threatened by GFSA's bid, AAC initially offered its 10% holding in Union Corporation to General Mining but, after the latter had raised its holding to 29.9%, AAC switched its support to GFSA. Since its parent Sanlam was not prepared to bear the full risk, Genmin was only able to acquire control with the financial assistance of Rembrandt. This resulted in increased interpenetration between large-scale Afrikaner concerns, with Rembrandt subsequently taking a 25% stake in Genmin, which reorganised itself and Union Corporation into Gencor in 1980. Through Union Corporation, Afrikaner capital acquired footholds in two important sectors, pulp and paper through Sappi and platinum through Impala, the latter later growing into the world's second largest producer after AAC's Rustenburg Platinum.

Interpenetration took place within Afrikaner capital too but was not without associated conflicts. Having jointly financed General Mining's takeover of Union Corporation in 1975 and the subsequent formation of Gencor in 1980, publicly antagonistic relations developed between Rembrandt and Sanlam.[14]

The 1980s, then, witnessed the emergence of six interpenetrated "axes" of capital straddling the mining, manufacturing and financial sectors, chapter 2. Their

[13] "Independent" in that it was not within the controlling sphere of any of the South African conglomerates.

[14] While less relevant to the arguments here, the reason stemmed from Sanlam's heavy-handed ousting of Gencor chair, Wim de Villiers, apparently because he had opposed a Sanlam directive to purchase a company owned by the son of then Sanlam Chair, Wassenaar. By then, Rembrandt had increased its stake to 30% of Gencor.

origins differed ethnically and sectorally. AAC had moved from gold and diamond mining into domestic manufacturing, domestic finance and regional and international mining. Sanlam had used its pooled Afrikaner financial resources to break into mining and manufacturing. Rembrandt had grown domestically and internationally retaining a focus on cigarettes, tobacco and liquor production, but also diversifying its investment portfolio. Anglovaal, the smallest group had retained a historical base in manufacturing while Liberty/Standard bank had remained in the financial sphere. Thomas Barlow had developed its manufacturing interests, diversified into mining through acquisition of Rand Mines in 1971, and had retained the financial backing of SA Mutual, mainly to prevent itself from being taken over by other conglomerates.

The extent of oligopolisation at the sectoral and sub-sectoral levels in mining and manufacturing is evident. The "axes" dominate mining through their mining holding companies, (table 2.2), between which there is extensive interpenetration through cross-holdings, (table 2.12). The manufacturing sector has increasingly been dominated by the six "axes". The bulk of the manufacturing sector's assets are listed on the Johannesburg Stock Exchange, with more than 80% held by the conglomerates, (table 2.6). However, ownership concentration extends to the disaggregated sub-sectoral level, (table 2.7). Increasing concentration and control of the financial sector by the conglomerates became apparent in the 1980s, (table 2.9), reproducing the economic and political power of both English and Afrikaner fractions of capital.

Thus, by the early 1980s, the disjuncture between English and Afrikaner capital had eroded sufficiently to allow coordinated industrial policies to be effected. Booming commodity prices in the historically evolved institutional context ensured that the site of

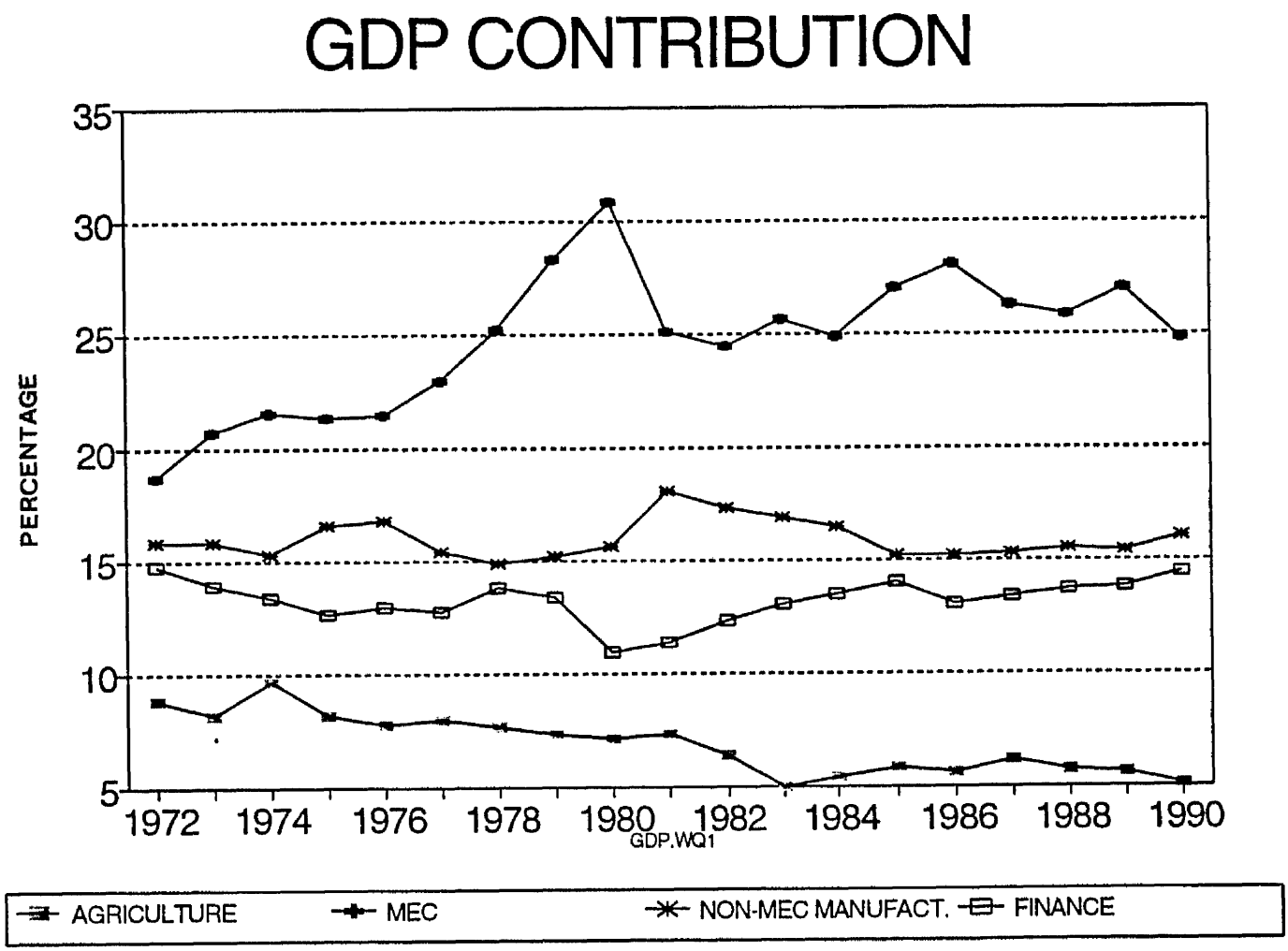
accumulation remained in and around MEC industries. The policies adopted, while facilitating MEC exports, also ensured stable and conducive relations governing the profitability of internal markets. The conglomerate form that emerged straddled the mining, manufacturing and financial sectors and, while each of the six "axes" of capital were historically associated with either English or Afrikaner fractions, their degree of interpenetration of ownership and coordination of activities across a variety of sectors reduced the influence of the disjuncture.

4. POST-1980 PARADOXES OF THE MEC - THE LIMITS TO GROWTH

The six "axes" of private capital entered the 1980s with increasing strength and cohesion, particularly through extensive oligopolisation of most productive sectors. The disjunctures between economic and political power had eroded across a wide range of economic sectors. The benefits of scale economies through acquisition were also reaching their limits, and the fractions of capital in South Africa became more open to state coordinated industrial policies, both within and without the MEC. Paradoxically, by 1980, the crisis of apartheid began to foreclose possibilities for state coordinated industrial strategies which sought to diversify out of the MEC, as the latter focused more on monetary policy following the debt moratorium of 1985. Paradoxically also, conglomerate control of the financial sector led to increasing speculative domestic investment activity and illegal capital flight at the expense of productive investment. While large investments have been made in the late 1980s and early 1990s, these have been solely in core MEC sectors, with corresponding consequences for broader future economic growth.

After the gold price peak in 1980, the GDP contribution of the MEC fluctuated around 25%, rising after the devaluation of the Rand to average 27% until the fall in the gold price after 1990, when its contribution was 25%, (figure 4.10).

FIGURE 4.10 - GDP CONTRIBUTION, 1972-1990



Source: South African Statistics (1990), IDC (1992).

There is little empirical evidence of diversification out of the MEC core. Investment in these sectors declined relatively in the 1980s, (figure 4.3). Non-MEC manufacturing's contribution actually fell from 18% in 1980 to 15% in 1985 but rose slightly to 16% by 1990. This was probably due to increased engineering sector activity during the construction of the Mossgas project.

State industrial coordination during the 1970s, however, had been uneven across sectors and was short-lived. As MEC projects such as mineral processing and Sasol were completed in the early 1980s, export commodity prices declined. Since there was no structural or institutional basis laid down to diversify into non-MEC sectors, the latter declined according to the fortunes of the MEC (except for some sub-sectors driven by military and mega-project expenditure, whose buoyancy was prolonged until the late 1980s)

A confluence of factors in the 1980s contributed to impeding any diversification out of the MEC. The orientation of the corporate sector and the nature and structure of the financial sector, together with policies of deregulation in the latter were not conducive to encouraging diversification. With most major mining and manufacturing assets having been acquired by conglomerates in the 1960s and 1970s, a flurry of financial sector acquisitions followed deregulation in the 1980s, consolidating conglomerate power at the level of the financial sector. This is reflected in financial service contributions to GDP rising from 11% in 1980 to almost 15% in 1990, (figure 4.10).

Prominent among the efforts in the 1980s in centralising and concentrating financial sector interests was the recent emergence of the ABSA banking group. As the largest group in South Africa, it is a testament to

the success of such objectives, representing the merging of Volkskas, United, Allied, Bankorp and Trustbank, largely Afrikaner-oriented institutions.

4.1 FINANCIAL SECTOR PARADOXES

One of the consequences of the way in which Afrikaner capital has been promoted and, ultimately, integrated with large-scale capital in general is to have generated a particular relationship between finance and industry. Whilst there are close ownership linkages between mining/industry houses and finance houses, these have not been conducive to long-term investment in industry. Rather, the South African financial system has been much more geared towards the buying and selling of financial assets than in the creation of productive assets. Roux et al (1991) address the role of the financial system. They recognise that it has been subject to criticism, being accused of, p.2:

> allowing excessive speculation, of not financing productive investment, of ignoring the needs of important sections of the population, of channelling too much saving through the contractual institutions, of overextending its lending activity, and of being dominated by a few powerful operators.

Such issues tend to be addressed in a framework of the supply of and demand for funds. Almost inevitably, this leads to the conclusion that inadequate levels of (manufacturing) investment are primarily due to lack of demand for funds, not their absence of availability. The financial system would respond to signalled investment opportunities if these were profitable, even if the funds have to filter through a series of intermediaries which effectively convert short term speculative activity into sources of long term manufacturing investment. Indeed, it

can even be argued that the complexity and variety of financial intermediaries can serve to enhance the types and levels of investment funds available. It is thus not surprising that the Financial Mail rejected the IDC's role as an industrial financier in the early 1980s.

> Whether the IDC was necessary or successful in the past is now a fatuous question. There are as many pros as there are cons. The point is whether it will continue to be useful in the future now that the country enjoys developed capital markets and has a core of developed technical skills[15]

The logic of this view is more attractive than its realism. A complex and sophisticated financial system may operate in this way, especially if the real economy is booming, although it is assigned an extremely passive and reactive, rather than an active, role in generating manufacturing investment. To the contrary, finance can be trapped within speculative activity that is self-sustaining. A more satisfactory approach is to reject supply and demand as a starting point and to examine the institutional context within which investment takes place. For the distinction between supply and demand is obscured once it is recognised that there is a close relation between saving and investment within those corporate structures that control both, whether it be through internal financing or the relationship between financial and non-financial branches of the conglomerates. The appropriate question then becomes somewhat different. To what extent, does the financial system serve both to fund and direct the level and restructuring of manufacturing investment?

Interestingly, in this context, Roux et al (1991, p.11) draw a parallel with the UK financial system:

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15 Financial Mail 29-1-82, p.398.

> Financial arrangements in South Africa are largely modelled on the British banking system. Within this framework banks are primarily confined to short-term lending and money market activity. The stock exchange occupies a distinct, but equally central position, since it is assigned the dominant role within the capital market.

There are similarities between the two banking systems both in institutional organisation and in the structure of finance. There are also, however, significant differences between the South African and UK systems, which makes each of them unique (and, for the former, a high level of concentration and intimate connections to other corporate structures, especially with mining, which might have been expected to lead to more direct avenues to manufacturing investment). This raises questions of the suitability of the South African system for promoting industrial investment given its higher level of development of banking relative to its more general level of economic development, even if the UK could be taken as an appropriate model to be emulated.

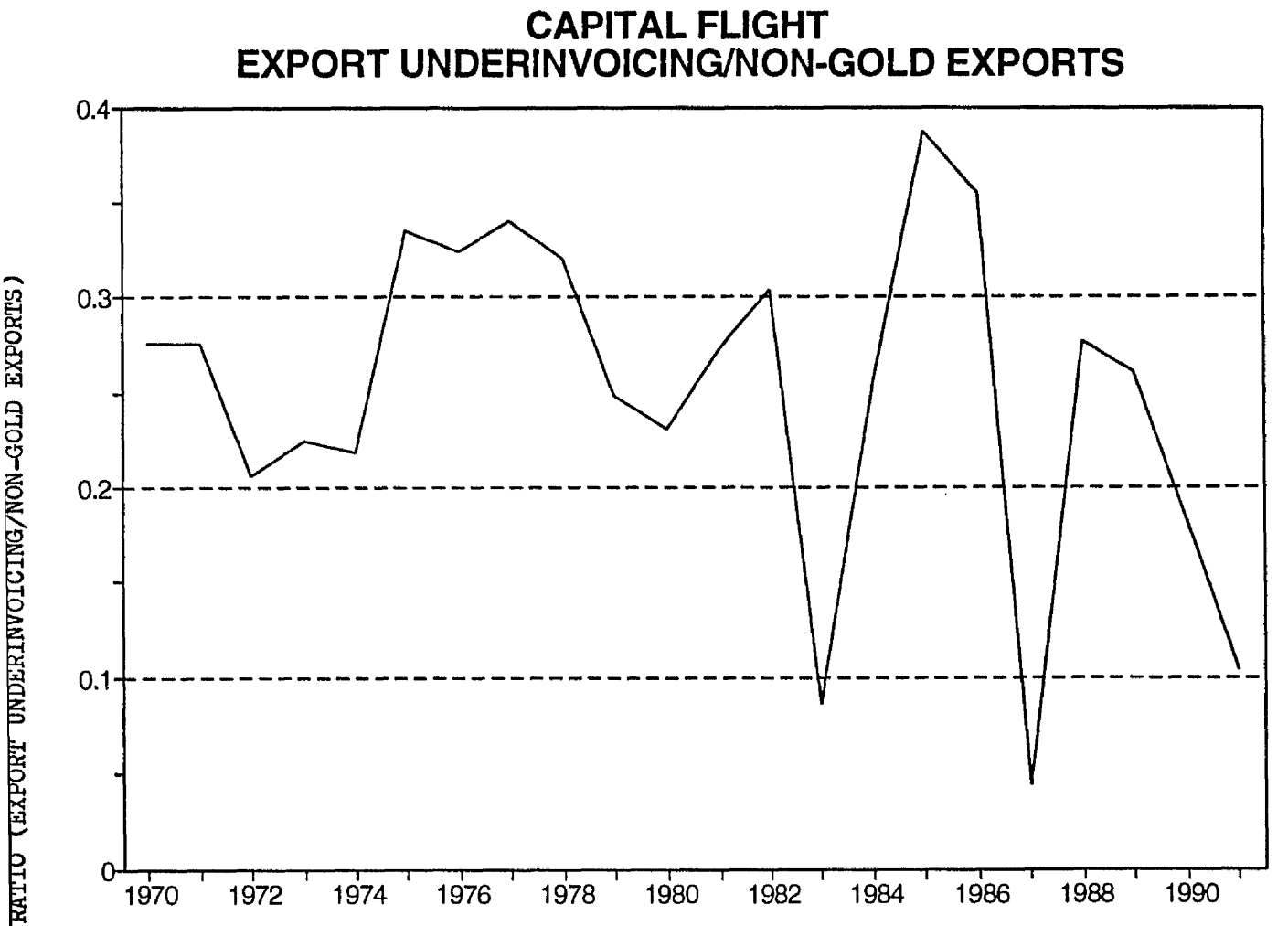
Of course, the UK cannot be taken as a model. It has suffered from low levels of ineffective manufacturing investment exactly like the South African economy. There has been a long tradition of argument that this is due to the nature and power of the financial system in its influence over economic policy and in its greater commitment to speculative global short term financing as opposed to long term financing of investment in domestic industry. Fine and Harris (1985) argue that this is both a cause and effect of the structure of the British economy in that the financial system does not itself serve directly as an agency for the restructuring of British industry (unlike, say, German and Japanese banking) and nor does it respond constructively, if more passively to the needs of industry, given its

preoccupation with short-term, speculative, financing. A similar, if not identical situation has prevailed within South Africa. And macroeconomic policy has been geared around support to the financial sector under the guise of an otherwise neutral commitment to stabilisation of inflation, the exchange rate or the balance of payments. The result then is that, although greatly concentrated in the 1980s, the financial structure did not encourage productive investment but encouraged speculative activities instead.

Further, since the early 1970s, both English and Afrikaner capital have begun to adopt an outward orientation, investing off-shore. Illegal capital flight, always part of the structure of South Africa's politically charged, mixed economy, increased dramatically, largely through the mechanism of transfer pricing.[16] It has also been accompanied by a publicly vociferous campaign by corporate capital for the lifting of capital and exchange controls. Capital flight has been estimated to have run at around 25% of the value of non-gold exports, most of which were raw and processed minerals from MEC sectors,[17] (figure 4.11).

[16] See Kahn (1991), Rustomjee (1991) and Smit and Mocke (1992)
[17] Gold exports have been more strictly monitored by the Reserve Bank.

FIGURE 4.11 - CAPITAL FLIGHT, EXPORT UNDER-INVOICING/NON-GOLD EXPORTS



Source: Rustomjee (1991).

Increasing capital flight through transfer pricing, a mechanism favoured by transnational corporations, is directly linked to the internationalisation of domestic capital. This has not only been confined to English capital, as represented by AAC. For example, Rembrandt had internationalised from an early period. By 1961, it had operations in more than a dozen different countries. In 1981, it sold a share of Rothmans to the US cigarette-maker Phillip Morris and used the proceeds to finance further off-shore diversification.

While internal opposition to apartheid had always been important, by the mid-1980s it was strong enough to prompt a withdrawal of foreign capital, the latter also affected by the global financial crisis involving third world debt. Thus, instead of coordinating the privately-owned financial sector within cohesive industrial policy, the state first deregulated the sector (flush with gold revenues in the early 1980s) and, after the fall in the gold price and the debt moratorium in 1985, focused more on monetary policy rather than on industrial policy.

4.2 MANUFACTURING SECTOR PARADOXES

Despite the shift in the orientation of some state agencies towards liberalisation in the 1980s, a most cohesive industrial policy was maintained almost until 1990 for the production of armaments. Several sub-sectors of manufacturing associated with arms production remained buoyant, despite recessionary conditions prevalent in the economy between 1981-83 and 1984-86 and after 1988. While fixed asset values of the engineering sector declined in the 1980s, the value of assets held by Armscor actually grew over the same period.[18]

[18] Rustomjee (1993, p.138)

This partly reflects a paradox in policies of industrialisation in South Africa, uneven as they have been across sectors. Given the unsustainable political policies of apartheid, both domestically and regionally for which arms production was both supportive and dependent, such a strategy was always unlikely to diversify industrial activity significantly away from mining, processed minerals and chemicals.

Another paradox of state coordination around the MEC is evident in the chemicals industry. In the 1970s, state coordination fostered a synthetic fuel industry. Although it regulated and mediated between the interests of English, Afrikaner and transnational capital, the competition between the former two undermined the extension of industrial coordination around fuels to cover chemicals. Base (organic) chemical production is, of course, usually a joint activity of fuel refineries, (whether crude oil- or coal-based). The chemical industry had been the site of competition between the two largest entities, AECI and Sentrachem, with the latter never having been a serious challenger. Sasol, on the other hand, by its sheer size and its association with the IDC and Afrikanerdom, became a threat as its output increased after 1982. It lobbied for and achieved deregulation of the explosives industry and, with burgeoning production, made increasing in-roads into explosives and fertiliser markets which had long been the preserve of AAC's AECI.

Thus, on the one hand, state coordination of the national chemicals industry became possible in the mid-1980s, particularly through Sasol's production of a considerable proportion of national bulk chemicals such as ethylene, alcohols and other intermediate feedstocks. On the other hand, deregulation considerably undermined the potential for a coordinated industrial strategy around chemicals. It also undermined the achievement of economies of scale at the national level and very little

new investment was subsequently made in the chemicals industry until the mid-1980s.

At the time, state policy makers were more concerned with ensuring liquid fuel supplies to South African industry as a whole and less inclined to adopting a strategic approach towards coordinating fuel output with chemicals production and coordinating bulk chemical output with the development of downstream industries. The lucrative nature of these well-regulated synthetic fuel projects also made them the subject of private capital's attention in the early 1980s. Several private sector consortiums, involving various combinations of English, Afrikaner and transnational corporations, put forward proposals for synthetic fuels projects that were to follow Sasol III into the 1980s. Perhaps not surprisingly, the state approved the construction of the Mossgas synthetic fuel plant, a design which used Sasol's synthetic fuel process under licence. Gencor was also offered the option to take a share in the project on completion. Private sector interpenetration in the fuels and chemicals sector also continued. In 1989, Gencor purchased the refining and fuels interests of divesting transnational Mobil and has subsequently developed this into Engen, a diversified fuels exploration, production and refining division with significant off-shore interests.

In 1993, the commitment to coordination has receded through the partial privatisation of Sasol and policy proposals for the deregulation of the fuel industry. A large proportion of Sasol stock is now held by various financial arms of the six private sector "axes". Cost overruns on the Mossgas project have also been a focal point of an ideologically-based attack by private capital on the coordinating role of state institutions.

4.3 INSTITUTIONAL PARADOXES

State institutions previously coordinating industrial policy were not unaffected by these historical developments. The Board of Trade and Industries (BTI), administrator of tariff policies, was emasculated in 1992 by the BTI Amendment Act, and the IDC assumed the role of industrial policy formulator and implementor.

This is not surprising since it had been the IDC's role to foster and further the interests of large-scale capital, and it seems only natural that the latter, having acquired a cohesion as never before, should find a corresponding institution within the state apparatus to pursue its appetite for big foreign exchange generating projects, requiring state support and guarantees (but not coordination).

The apartheid state, prior to transitional government in the 1990s, appears to have withdrawn from any active coordination of industrial policy to diversify out of the MEC. The weight of past investment and the present institutional orientation have acted to keep the trajectory of industrialisation firmly in and around the MEC core. The stagnation of the economy and political paralysis in adopting coherent, long-run industrial policies are leading to investments which can be regarded as strategic and subsidised staging posts for future private sector operations lying, as far as is technically possible, outside the reach of a future post-apartheid state and its political constituencies. This is the domestic counterpart to capital flight and disinvestment and, together with mergers and acquisitions, is part of the MEC's continuing influence as a system of accumulation.

CONCLUSIONS

To conclude then, the political economy of post-war industrialisation in South Africa has been traced largely by examining the process of change within the capitalist class.[19] This appears to have exhibited three overlapping phases in what is essentially a history of the creation of large-scale Afrikaner capital, its interpenetration with English capital and, ultimately, their combined collaboration with the state. The first phase, centred in the 1950s, witnessed the state's successful encouragement of the development of large-scale Afrikaner capital. The second phase around the 1960s witnessed the interpenetration of large-scale Afrikaner capital into mining, with the active collaboration of both the state and mining capital itself. As a result, by the 1970s, there was no longer a political obstacle within the capitalist class to the adoption of a concerted economic strategy on the part of the state.

Indeed, one was adopted. But economic conditions had changed, both through the collapse of the Bretton Woods system, and the associated rise in the price of gold, and through the oil shock which similarly enhanced all energy prices. Consequently, the state and private capital drew upon policies to strengthen the MEC in its core activities. Thus, the third phase, emerging in the 1970s, consolidated the collaboration between MEC capital and the state with extensive, if not comprehensive, coordinated polices for the economy emerging for the first time in South Africa's history. They were directed at the MEC, through the expansion of public and private investment to promote mineral, heavy chemical and energy production, both for domestic and foreign markets. In addition, a highly coordinated strategy to produce armaments was also implemented. By the 1980s, even as the

[19] There has been considerable research and study into the historical role played by other classes in the development of South African industry, and while our approach does not detract from their importance, we have chosen to cover a less researched but equally important subject.

boost to core MEC activities was eroded, the apartheid system as a whole was in crisis. With increasing sanctions, disinvestment and labour and social unrest, it is hardly surprising that a coherent industrial strategy to diversify industry out of and away from the MEC core sectors continued to remain far off the agenda. These adverse conditions might be considered sufficient reason for faltering industrialisation but they were reinforced by the mode of operation of the economy, particularly of its previously developed financial system, this being more geared to speculation than to long term provision of investment finance to industry. And the policy priority of the financial system has been oriented around macroeconomic objectives rather than those of industrial development as in the disastrous liberalisation of the financial system in the early 1980s.

In conclusion, two views of post-apartheid economic prospects arise. One is positive and concerns the scope for economic development and growth, and the provision directly and indirectly of basic needs, arising out of the potential already established by the MEC from which economies of scale and scope have yet to have been fully realised. The other is less certain and requires that policy debate be firmly rooted in the economic and political realities associated with the continuing presence of the MEC. It will be no mean task to formulate and implement policies that conflict with, and yet depend upon, the interests of a peculiarly powerful and uniquely institutionalised class of corporate capitalists.

CHAPTER FIVE

THE INFLUENCE OF THE MINERALS-ENERGY COMPLEX ON POST-WAR INDUSTRIAL PERFORMANCE IN SOUTH AFRICA

INTRODUCTION

In the previous chapter, focus was placed upon the evolving relations between different fractions of capital. This chapter is concerned with the issue of industrial policy - how it developed and how it has been debated.

Post-war industrial policy has been conducted mainly through the use of three instruments: firstly, the creation of state corporations and joint ventures with private capital; secondly, the extensive use of tariffs; thirdly, industrial decentralisation. In Section one, the conduct of these industrial policies is traced and shown to have been mediated by the role of the MEC as a system of accumulation, in particular, by eroding the disjuncture between English and Afrikaner capital. Although the MEC's impact has differed over time and across sectors, it effectively led to policies which, both supported its core sectors, and precluded the adoption of other industrial policies of diversification away from economic dependence on South Africa's resource base. This was despite numerous recommendations to the contrary, by official Commissions of Inquiry into industrial performance. Further it is demonstrated that the industrial policies that were actually pursued, particularly by two key institutions, the Industrial Development Corporation (IDC) and the Board of Trade and Industries (BTI), followed a separate path from that promoting industrial diversification.

In reviewing past debates in Section two, it is shown that, on the one hand, these have changed in

parallel with more general developments in the theory of industrialisation and development. On the other hand, it is remarkable how the themes of the debate and their interpretations of industrialisation have remained unchanged, these often being resurrected from time to time. The rhythm and themes of debate are discussed in Section three and it is found that past debates over industrialisation have been based, both on a false perception of the pattern of industrialisation and on a partial and even false recognition of how industrial policy has been adopted and implemented in practice.

Two specific examples are used to illustrate this. First, the commonly accepted past and prospective trajectory of import-substituting industrialisation (ISI) (backward from consumption goods to intermediate and then capital goods) is shown to be contrary to the actual form of post-war industrialisation in South Africa, which has run in the opposite direction even if to a stunted extent. Second, as already shown in Chapter 1, a false dichotomy has been drawn between mining and manufacturing activities, masking the evolution of a MEC that straddles both. The presence of the MEC core and its role as a system of accumulation has thus been overlooked in past and present debates on industrial performance and the consequences of this are drawn out in the final Section.

1. THE CONDUCT OF INDUSTRIAL POLICY

As a system of accumulation, the underlying thrust of the MEC was the empowerment of Afrikaner capital, ultimately fostering the latter's successful interpenetration with English capital. This has had a profound impact on industrial policy, reducing it to three relatively uncoordinated, and even incoherent, components, namely, the creation of state corporations, mainly around the MEC, the application of trade policy through tariff protection and, thirdly, policies of industrial decentralisation. While these policies have varied over time and across sectors, they have never actively sought to diversify out of the MEC on a long term basis.

1.1 INDUSTRIAL DEVELOPMENT AND STATE CORPORATIONS IN THE 1950s

The creation of state corporations as instruments of industrial policy began in the early 1930s with the creation of Iscor. This had an enormous propulsive impact on the economy, both directly and indirectly. Most subsequent state corporation investment was made in this and other MEC sub-sectors, with considerable downstream interpenetration through joint ventures with private capital. Despite this, the broader role of state corporations in industrialisation has usually been overlooked - or viewed separately from privately-owned industries upstream and downstream of the parastatal.

Clark (1987) provides the most comprehensive discussion of the role of state corporations in South Africa, focusing especially on Escom and Iscor. Her work has been discussed elsewhere, in Chapter 3. There is little evidence that these corporations were set up to act or could operate as stepping stones predominantly for

the promotion of national capital at the expense of foreign or mining capital. The latter were essential to their operation, especially as customers, p.345:

> Indeed, it was difficult even for the state-sponsored industries to diversify economic development away from the mining industry.

Thus the inter-war period witnessed varying degrees of cooperation and conflict between Iscor and private capital. Coming out of the second world war, the state corporations saw private capital as potential competitors, undermining their own commercial viability. This seems to have been more important than establishing a more or less favourable relation to one or other fraction of capital. For the Board of Trade and Industry (1946, p.64), the curtailment of Iscor's activity was motivated by the wish to minimise its competition with the private sector, indeed to serve it through providing its basic input:[1]

> In view of the fact that the primary object in establishing the Corporation was to provide the country with cheap steel, the Board feels that under no circumstances should the Corporation undertake the processing and manufacture of secondary products which can be economically provided by independent undertakings.

Nonetheless, the symbiosis between the corporations and private capital was subject to some scrutiny after 1948, since there was suspicion of subsidy to private capital through joint ventures. This was not without foundation since the Victoria Falls Power Company, for example, was only purchased by Escom in 1948, having been owned previously by mining capital that had benefited

[1] See also p.66. For an account of how the state-owned steel corporation in Britain was used to promote private steel companies prior to its privatisation, see Fine and Polletl (1992).

from wartime profiteering. Paradoxically, the purchase was made with finance underwritten by Anglo-American which also entered into a joint venture with Iscor to form Vecor, a heavy engineering company utilising steel output from Iscor.

It is against such a background that the development of both state and private industry must be assessed. There is no doubting the widening scope of state corporations such as Iscor and Sasol, both in their exclusive activities and in their collaboration with the private sector. Phillips (1974, p.242) refers to Iscor's "far flung activities and the depth to which it had penetrated the economy even before 1939", and for Norval (1962, p.17), the Chair of the Board of Trade and Industries during the 1950s:

> It is difficult to over-estimate the importance of the role played by Iscor, with all its ramifications, in the economy of South Africa. There is hardly a sector in the country's economy which its activities do not permeate and influence to a greater or lesser extent.

Webster (1985, p.130) illustrates how by the 1970s, "the ownership of the seven largest foundries was concentrated in the South African state through Iscor and IDC, international capital and local mining and industrial finance". Joint ventures, and the all too familiar feature of interlocking ownership, involved companies such as British Steel, GEC International, Barlow Rand, Anglo-American and General Mining. Similarly, Sasol has proved the basis for diversification into (heavy) chemicals, again through involvement with the private sector.[2]

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[2] For an early illustration, see Houghton and Dagut (1972, p.195).

In this light, large-scale state investments and corporations must be assessed in relation to the broader context within which industrial development has been taking place. To what extent have they served to foster dynamic economies and new industries and linkages, both sectorally and in support of private capital? Nor are these questions that can only be asked in retrospect. Norval (1962), for example, anticipated a bright prospect for South Africa in iron, steel, engineering and metal industries, including exports, as long as appropriate policies for training and research and development were adopted. A similar stance is adopted in relation to chemicals, in each case on the basis of the availability of indigenous natural resources and the initial development of state and private corporations. In the event, his hopes proved futile (although such goals are even now re-emerging, with significant privatisation of the state corporations). Thus, whilst there was a necessary integration between state and private capital, it was one which has largely been confined to the MEC core.

The IDC has played a major role in conducting those aspects of industrial policy concerned with the creation of state-owned industries around the MEC. It also conducted the now abandoned industrial decentralisation programmes and administers policy in support of small business.

Its promotion of large-scale investments in Sasol and Foskor in the 1950s are seen by Clark to have accepted the limits of the form to be adopted by South African industrialisation - namely the use of minerals to produce industrial goods and provide support for skilled white as opposed to unskilled, black employment. She cites the example of the promotion of the manufacture and export of rayon pulp but not of the development of rayon manufacture, Clark (1987, pp.337-8). Influential policy

makers also seemed wedded to an industrial trajectory explicitly based on increasing both capital and energy intensity and, hence, mechanisation. Sectors were targeted according to perceived comparative advantage and lay largely within the MEC. Addressing a delegation from the California Institute of Technology in 1962, H.J. van Eck (the then Chairman of Escom and IDC) stated;[3]

> In South Africa, far from relying on so-called cheap labour we believe in the application of power. The generation of electricity per head is just about 1500 kWh per annum. It is equal to the per capita generation of a very highly industrialized country like Great Britain only six years ago. In other words in the development of power and the use of power, we compare favourably with the countries of western Europe. Van Eck in Gerber (1973, p.105)

> The fields in which we have comparative advantage are iron and steel, foundry products, ferro-silicon, ferro-chrome, ferro-manganese, timber as a cheap raw material because of the high rate of growth of trees in certain areas. Van Eck in Gerber (1973, p.112)

Writing in 1962, Norval (1962) noted that;

> It would be extremely unwise for South Africa to enter into long-term contracts for the sale of its base minerals, even in a semi-processed state, p.25 ... In the chemical field South Africa possesses a vast potential for the manufacture of a large range of chemicals, which are presently being imported by a considerable number of industrialists as raw or

[3] The seminar was hosted by the South Africa Foundation and included the president of the CSIR in South Africa, Meiring Naude.

> semi-manufactured materials for use in their respective manufacturing processes. It is a field too which, next to iron and steel, will, in course of time, lend itself to the development of large-scale exports, not only to adjoining territories, but to other parts of the world, as has already been demonstrated by some of the concerns operating in the chemical field, p.39

The heady optimism and determinism of the time is clearly reflected in a startling statement by Van Eck on the need to curb growth, and it also records the early recognition of problems of skill shortages and high import propensity.

> ...our growth rate should not be very much faster than an average over the years of 5 per cent per annum because a high growth rate sets up difficult strains in the economy. A high growth rate increases our imports because of our high marginal propensity to import...I don't think we should grow much faster than 5 per cent because of the problems of social adjustments, housing conditions town and regional planning and all the other factors that enter into development in a highly complicated multiracial society with vastly different stages of cultural and economic development. Van Eck in Gerber (1973, p.106)

> I regard it (5%) as a pretty good rate...we cannot move faster unless we train our people better, unless we have more managers skilled in various directions, scientists, technologists, engineers and people with high managerial ability. Van Eck in Gerber (1973, p.106)

In summary then, by 1960, the creation of state corporations and their support for related industries had played a pivotal role both for the MEC and industrialisation but its potential was subsequently never fully exploited in extending the scope of manufacturing.[1] Thirty years later in 1991, the IDC's priorities have remained with the MEC. Mineral beneficiation targets included financing the Columbus stainless steel plant, the Alusaf aluminium smelter project and Foskor's potash/alumina project. Chemicals and paper projects include Sappi's Saiccor expansion and Sasol's acrylic fibre plant.[2]

1.2 TARIFFS AS INDUSTRIAL POLICY

Tariff protection was neither all pervading, nor was it ever central to determining the pattern of industrialisation. It was the disjuncture between English and Afrikaner capital, the formation of state corporations and the latter's interplay with private capital that was central in influencing post-war industrialisation. The erosion of the disjuncture between the two fractions of capital - as the former grew in strength and interpenetrated with the latter - has partly undermined the rationale for tariffs, as is evident in the demise of the BTI and the IDC's present overtures in negotiations on the General Agreement on Tariffs and Trade (GATT).

The Board of Trade and Industry, the state agency, wielding the tariff instrument of industrial policy, interfaced (mainly) most directly and continuously with the private manufacturing sectors. Norval (1962, pp.121-2) is emphatic on the role played by protection to ensure the viability of local production, and he observes that

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1 In regard to industrial policy and performance, many recognise the existence of state-owned industries but view them as being inappropriately targeted, Moll (1991), or inherently inefficient compared to privately-owned industries, Fallon et al (1993) and Levy (1992).

2 IDC senior General Manager, Malcom MacDonald quoted in Business Day 1-11-91.

such support was strengthened following the second world war once duties could be offered by the Board in advance of the setting up of productive facilities. Institutionally:

> It is doubtful whether in any country in the world there is a closer contact between the body dealing with tariff matters and industry than exists between the Board of Trade and Industries and the manufacturing industries in South Africa.

Opposition to tariffs in the 1930s had been rooted in the disjuncture between English and Afrikaner capital. Iscor, created in the face of intense opposition by mining interests who would rather have built their own plant under protection, was undermined by dumping in the mid-1930s. Dumping was common for a wide range of goods in the 1930s and lowered input costs for mining capital. The influence of the latter after the political defeat of the Nationalist and Labour Pact in 1933 is evident in the report of the Holloway Commission (1936). Holloway argued that protected industries were not internationally competitive because their white labour costs were much higher than in Europe.[3] Clark (1987), however, has demonstrated that Iscor, which would have been the most likely industry to retain the "civilised labour" policy, was busy substituting cheaper black labour at this time to reduce costs.[4]

Even if tariffs were meant to provide a propulsive effect to industrialisation, they were ineffective due to poor management and a failure to appreciate the importance of linkages between protected sectors. After WWII, the Board of Trade and Industries (1945), while recognising the extent of protection, viewed this as a

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[3] See Zarenda (1977).

[4] Iron ore mining and steel making processes involved an extensive division of labour, and such policies did not apply to all categories. Moreover, Iscor's policy was fluid, contingent on political lobbying and sensitive to the lessons drawn from strikes by black power station workers in 1943.

temporary necessity to protect infant industries during post-war reconstruction. Thirteen years later the Viljoen Commission (1958) reported. Unlike Holloway, Viljoen did not evaluate the effects of past tariffs on the manufacturing sector. Its brief was to report a) whether existing tariffs were adequate to ensure growth and employment creation; b) whether growth could be sustained without imposing a burden on mining and agriculture; c) the constraints to accelerated growth and d) the adequacy of policy machinery to combat dumping by importers.

Viljoen's starting point was that, since possibilities were limited in the mining and agricultural sectors, the burden of employment creation would have to fall on the manufacturing sector. Manufacturing's high import propensity was viewed as a constraint on high rates of growth and, therefore, Viljoen's recommendations were to restrict imports, raise exports and increase capital inflows. Viljoen's recognition of the need to raise exports is not overlooked by Brand (1976), who has argued that the debate at the time on industrial policy was not between either import substitution (ISI) or export orientation (EOI), but is more usefully seen as being over the balance of emphasis between each, with Viljoen falling into the group favouring emphasis on the former. The policy instruments to achieve this included retaining import tariffs, but Viljoen went further, recommending targeting of sectors to be protected and singling out two industries for special protection,[5] including the motor industry which would forge economic linkages downstream of the steel and chemical industries.

The challenge posed then, by what otherwise appears to be a most sensible reconciliation between inward and export orientation, is that it leaves the entire onus of policymaking on the ill-defined practice of selectivity. This raises the issue of the selection of industries to receive state support, whether through tariff protection or by being created from scratch as state-owned

[5] Viljoen Commission (1958, PI, SI, sch28, III).

enterprises. The evidence is that this process was not based on an adequate assessment of the targeted sector's potential to fulfil the objectives of economic policy. The latter might have been a combination of balance of payments constraints, employment generation, industrialisation to diversify out of dependence on gold, protection of infant industries, or more short term measures in response to the unfair competition associated with various forms of "dumping".

Early on, Laight (1955) had argued against protection as a general policy and warned that its selectivity for infant industry, to broaden the industrial base, in response to "unfair" competition, or as a temporary measure in response to cyclical unemployment had to "be very carefully defined and constantly reviewed", p.222.

The intention was that selectivity should be determined by economic goals and potential, but how well could these be both identified and put into practice? The evidence on the first is far from satisfactory. Samuels (1959, p.181), criticised Viljoen along these lines for understating the linkages between primary and secondary sectors and failing to disaggregate the manufacturing sector adequately to determine sectoral sources of growth. He argued that a considerable portion of demand for manufacturing output came from mining and agriculture and, furthermore, that increased international demand for mineral and agricultural output could not be excluded as a source of economic growth. He pointed out that, since much of 1950s industrialisation involved capital-intensive investment in sectors such as chemicals and steel, the scope for employment creation was limited if this trajectory continued.

Tariff policy was poorly managed, bringing into question the basis of discretionary decisions, even over targeted sectors such as the motor industry. This was noted by Norval (1962, p.8):(emphasis added)

> ...the then Minister of Commerce and Industries made provision in the Enabling Act of the Board of Trade and Industries in 1947 for the establishment of costing systems, in a manner approved by the Board, in any particular industry or branch of industry enjoying customs tariff protection or receiving any form of State aid. Unfortunately not much has been done in this respect, but it is a matter which, in the interest of industry and in order to provide the Board with more reliable costing material to determine the measure of tariff protection needed, should receive earnest consideration.

This is a particularly damning indictment of the lack of scientific criteria for conducting industrial policy. Given Norval's acknowledgement of the centrality of tariff protection to industrialisation, a range of unnamed and presumably unquantifiable criteria, other than cost, were used to evaluate applications for tariff protection.

However, to divorce this choice of policy instrument from political and economic issues of the day is to miss important causal factors. Departmental discretion in licence and scarce resource allocation was exercised in favour of Afrikaner-owned concerns as early as 1949, and continued after the National Party secured electoral victory again in 1953. In a complaint to Ernest Oppenheimer MP in 1949, the African and European Company (a subsidiary of Anglo American, chaired by Oppenheimer) stated that advisers of the Department of Commerce and Industry;

> mostly young men of the Stellenbosch University type (were) very sympathetic towards the new low-grade (coal) producers.[6]

[6] Cited in Christie (1984, p.153).

Import and export permits, scarce railway freight space and power during periods of shortage were favourably allocated to these Afrikaner concerns.

Despite the warnings of the former chair of the BTI, poor management continued into the 1980s. Twenty six years later, the BTI (1988, p.4) revealed how poorly tariff policy had been administered, that tariff applications were dealt with in a reactive manner with no continuity (emphasis added).

> It was realised by the BTI that the approach adopted by the Government in the (1985) White Paper for continuous (sectoral) studies to be undertaken was a major policy deviation from the policies applied in the past. Previously the BTI reported from time to time on industrial sectors after having completed investigations into those sectors. There was, however, not a continuous involvement. In respect of tariff protection the BTI responded to applications by the private sector and initiated revisions of previously recommended duties. Even in such cases there was no attempt at continuous monitoring actions. It was a reactive rather than a pro-active procedure.

Although at the aggregate level, tariff discretion may have favoured large-scale Afrikaner capital, particularly after 1948, its application was rather uneven. During the 1950s, sectors that benefited most were mining, agriculture and the motor industries, which were treated as special cases, each with separate arrangements around the method of licence issue.

Any impact that trade policy might have had on industrialisation was mediated by its frequent use as a mechanism to protect the balance of payments, through increasing quantitative restrictions, Viljoen (1958).

This increased during the capital outflow crisis of the 1960s. Petrol, oil, coffee and yarn imports were not restricted under the import control regulations of 1958. However, 75% of imports were subject to licensing (with a few quotas from time to time) on the basis of meeting national market needs rather than for processing for export. In the 1960s, the policy instrument used to stimulate the targeted motor assembly industry was simply an extension of the scope of the permit system. For manufacturers with an acceptable local content programme, full requirement permits were issued. For others, CKD (completely knocked down kits for assembly) permits were only issued for 9 months stock at a time.

While, for Viljoen, tariff protection and import licensing were intended to be a temporary state of affairs, Lachman (1974) has outlined how these specific instruments became a permanent feature of industrial policy. South Africa's Gatt membership in 1947 imposed limits on tariff levels and, to by-pass this, import licensing was extensively used. Between 1949 and 1973 it grew to cover 80-90% of imports, with raw materials and capital goods being given priority licence allocation over consumer goods.

Lachman, citing Little, Scitovsky and Scott (1970), argued that the usual disadvantages of bureaucracy, rent seeking and misallocation made licensing an inefficient mechanism for the allocation of scarce foreign exchange. His alternative, reflecting the concern of the time, was to use the price mechanism as a policy instrument and to allow the exchange rate to float.

Thus, as a policy to shape industrialisation, tariff policy was neither coherent nor decisive. Instead it was reactive to interests of various fractions of capital. An empirical indication of the extent to which, and the ease with which, the Board has granted trade protection is revealed by the numbers of applications for support and

the proportion of these that were successful, (table 5.1).

TABLE 5.1a - BTI TARIFF APPLICATION RECORD

	Supported	Rejected
1990	155	198
1989	65	253
1988	140	226
1987	151	83
1986	137	96
1985	269	20
1984	198	151
1983	177	115
1982	119	7
1981	128	2
1980	142	125
1979	115	127
1978	160	142
1977	172	135
1976	140	169
1975	150	174
1974	157	121
1973	212	150
1972	187	112
1971	121	112
1970	81	115
1969	139	140
1968	111	97
1967	116	72
1966	147	85
Av. % 1958-67	47.8	52.2

Source: BTI Annual Report, various years.

In terms of its criteria of operation, the Board offered eight considerations to be taken into account when granting assistance.[7] Even though these were counterbalanced by a list of grounds, running from (a) to (m), on which an application could be refused, this only served to increase the discretion exercised by the Board. However, as early as 1945, the Board was hopeful that protection would decrease as manufacturing competitiveness was attained, BTI (1945):

[7] See Appendix II to the Viljoen Commission (1958). See also the discussion of the levels at which protection could be granted, pp.7-8. The Board's policy and practice remained essentially unaltered until the mid-eighties. Contrast the statement in the BTI Annual Report for 1985, pp.5-6, with those for 1989, p.12, and for 1990, pp.5-6, there being a shift in emphasis from protection to meet normal competition from abroad to one of export-orientation.

> The Board wishes to reiterate that the future of the Union's manufacturing industry does not lie primarily in the granting of protection in the form of assistance through customs duties or otherwise. Protection has, the Board fears, in some cases, enhanced immediate profits, without sufficient stimulation being given to the industry to improve its methods of production and marketing with an eye to its future stability. The future lies much more in the rationalisation of industry ... and the consequent reduction of the high cost structure.

Such hopes have not been realised. In its Annual Report for 1989, the Board divides export composition, excluding gold, into the following proportions; raw materials (42%), processed raw materials (45%), intermediate goods (8%), and finished products (5%). On the other hand, imports remain dominated by capital and intermediate goods, especially chemicals for the latter. Excluding arms, oils and miscellaneous goods, the share of machinery and equipment in imports has risen from 20.7% in 1946 to 49.3% in 1985, having peaked at 54.4% in 1980.[8]

In implementing the tariff component of industrial policy, there appears to have been little cohesion with industrial policies around state corporations and their joint ventures with the private sector. Table 5.1b, which should be viewed as indicative only, reveals a multitude of more than 200 tariff categories with low nominal tariffs on mining and manufactured intermediate and capital goods compared to India and Brazil. In addition, policy was usually implemented reactively and was poorly managed. Little or no continuous monitoring existed to provide a concrete basis for policy and to measure the effectiveness of such policy over time. In what was

[8] Figures calculated from Lewis (1990, p.59). See also Kahn (1987).

essentially a discretionary process, there is evidence that Afrikaner capital was preferentially favoured.

TABLE 5.1b - COMPARATIVE TARIFF LEVELS

	NUMBER OF CATEGORIES	MINING	MANUFACTURING CONSUMER GOODS	MANUFACTURING INTERMEDIATE GOODS	MANUFACTURING CAPITAL GOODS
SOUTH AFRICA	200+	3.0	48.0	18.0	17.0
INDIA	13	84.2	101.8	111.0	83.2
BRAZIL	34	21.8	66.0	39.4	47.9

Source: Belli et al (1993).

Thus, industrial policy has proved resistant to interventions over and above those that operate at the level of revenue, whether subsidising profits through protection against imports or compensating for the higher costs that these imply for manufacturing inputs. Nor have these interventions been sustained by a careful economic calculus, it long being recognised how no account has been taken of effective levels of protection. For example, protection for the textile industry has led to higher costs to the clothing industry which, accordingly, itself requires corresponding support to sustain its profitability. Balancing the relative costs and benefits to the two sectors has taken priority over transforming and advancing the connections between them.[9]

In short, the use of tariffs to target industrial sub-sectors selectively, was not accompanied with a range of additional supportive policies to overcome the numerous problems of industry identified by official investigations. Thus, contrary to the commonly held view, the overall pro-active thrust of industrial policy at the institutional level came, not from the BTI's tariff

[9] See the 1983 government report on textiles and clothing, for example.

protection, but from the support given to the MEC through the offices of the IDC.

1.3 DECENTRALISATION AND INDUSTRIAL TRAJECTORY

The academic discussion around decentralisation has been remarkably unanimous in its conclusions (and in its divergence from official pronouncements) over an extended period. It is perceived to have been an expensive failure and is not dealt with in any great detail here. The reader is referred to the relevant literature below.[1]

However, one early foray in the early 1950s involved creating a decentralised textile industry and proved disastrous. The IDC was then, and is still, concerned with decentralisation as well as with small business support, although its role has been devolved to, or been supplemented by, other organisations such as the Small Business Development Corporation (SBDC), formed in 1983, and the Board for the Decentralisation of Industry, formed in 1960.

In textiles, the IDC was unable to control its costs, was insufficiently funded and unable to guarantee a stable, low-waged, docile work force. The industry could not compete effectively with private capital, whose costs were lower since they had located in developed urban areas and also enjoyed tariff protection. Subsequent industries promoted by the IDC tended to be the more capital-intensive process industries, such as Sasol and Foskor, whose costs were more easily controlled. Here, mining operations were based on well-known coercive labour management techniques and supportive legislation, requiring little commitment to

[1] There is an extensive literature on the decentralisation of industry. For a selection with its own further references, see the June, 1990 issue of the South African Journal of Economics, Addleson (1990), Dewar et al (1986), Dickman (1991), Geyer (1989a and b), Holden (1990), Maasdorp (1990), Rogerson (1982), Rogerson (1987), Rogerson (1988), Tomlinson (1990), Tomlinson and Addleson (eds) (1987) and Wellings and Black (1986).

training as had been the case with textiles, while the processing operations required higher skilled white labour.

Political and ideological, rather than economic and industrial imperatives have driven decentralisation policy. In regard to its role in South Africa's industrial trajectory, three points emerge. First, the scope for such policy, even outside the context of apartheid, is heavily contingent upon the success of national performance and policy; the faster is economic growth, the greater can be the influence on the number and location of jobs away from traditional centres of industry. As growth in the sorts of employment that could be decentralised has been minimal within South Africa, in part as a consequence of its (lack of) industrial policy more generally, so the potential for decentralisation has been negligible even if it had been appropriately pushed with greater commitment.

Second, in practice, policy has never been sufficiently nor coherently funded. It has always been based upon, or dominated by, other objectives than a genuine commitment to homeland development.

Third, as a consequence, it is hardly surprising that the rationale for, and efficacy of, decentralisation policy should have become entirely subverted by lack of economic effectiveness and open to bribery and corruption. In the absence of any internal coherence and external direction, detailed decisions in implementation have become more or less arbitrary. As such, they are not so much random or misguided as a remarkable synthesis of South Africa's political economy, reflecting an overall lack of industrial policy as well as the increasingly byzantine compromises between the economics, politics and ideologies of the apartheid system. In short, decentralisation policy has both reflected and

consolidated the weaknesses of industrial development more generally.

1.4 SMALL-SCALE INDUSTRY

In practice then, and compared to its support of MEC core sectors, the IDC committed few resources in support of decentralisation or for small-scale industry. Norval (1962, p.98) observes that:

> In 1959 the Corporation had investments in 75 companies for a total amount of just under R130m of which just under R104m was invested in three major concerns. The balance ... was invested in 72 companies in the normal course of its business.

In other words, at a rate of R26m for 72 companies, the average support to companies was less than R300,000 compared to the average of over R30m to Iscor, Sasol and Foskor. State corporations in and around the MEC had been hugely supported by the IDC; its role otherwise has been, and continues to be, little short of token, (table 1.5).

This is also evidenced by examination of the beneficiaries of present tax incentives (under Section 37E of the Income Tax Act) and export subsidies. Ben Vosloo, Managing Director of the Small Business Development Corporation argued;[2]

> In the Budget for the 1991/92 fiscal year, R1.411bn was allocated to export trade promotion. This amount is distributed to about 2500 beneficiaries, most of which are large companies, under the General Export Incentive Scheme (GEIS). In the same Budget, only R75m was earmarked for small and medium size enterprise (SME) development through the Small

[2] Business Day 10-6-92.

> Business Development Corporation (SBDC)....In this year's Budget...R2bn has been allocated to the GEIS, but only R3.8m has been set aside for small business development.

Thus the agency entrusted with supporting small-scale business, the IDC, has never accorded it any significant priority. That has principally gone to the MEC.

In summary, by the early 1960s, the two prongs of industrial policy, namely state corporations and tariff protection, were operated in favour of large-scale, capital and energy-intensive industries within the MEC. Afrikaner capital was also favoured, resulting in greater penetration of several industries which were formerly the preserve of English capital. The latter's distinctiveness was further eroded in the 1960s as it bought up shares in industrial companies as foreign capital withdrew and as interpenetration with English capital increased. Industrial policy conduct did not alter this trajectory significantly during the 1960s.

1.5 PROMOTING THE MEC - THE REYNDERS COMMISSION

Fourteen years after Viljoen (1958), the Reynders Commission (1972) reported. Highlighting the need to shift to an outward orientation (a reflection of the economic debate of the time), Reynders (1975, p.131) identified a wide range of structural impediments to further industrialisation.

> ...if South Africa is to maintain its export momentum and to stop balance of payments constraints from becoming an obstacle in the national development process, continuous attention will need to be directed to import replacement on the one hand, particularly in

> the intermediary and capital goods sectors, and on the other hand, to the promotion of exports. The latter may perhaps best be secured by the process of export targeting through which the national export earnings are assessed and evaluated against the export potential of each economic sub-sector. And this in sum was the basic proposition of the export Commission.

Recommendations included improved productivity monitoring by the National Productivity Institute, government support in raising skill levels, export marketing assistance, improving the transport and port systems and removing labour market rigidities including apartheid restrictions. The concept of export processing zones was supported by Reynders together with recommendations for freight concessions for export inputs. Reynders also argued that industrial decentralisation policies should not undermine the economies of agglomeration and that policies should not hurt export industries in metropolitan areas. Ten years earlier in 1961, Van Eck had identified the same problem.

> As far as the Bantu border areas are concerned, the pace of development is still tragically slow, particularly with our high rate of population growth. The industrialist has to decide to go to a border area...where there are no cinemas, cafes, schools, or other amenities for his supervisory staff, no water, no roads, no communications, no power, no housing, no sewerage, inadequate health services and police protection. Why should anybody want to go there where he is far from his market? Of course he comes to Johannesburg instead. Van Eck in Gerber (1973, p.113)

Ratcliffe (1975, p.80), however, warned that Reynders had underestimated the extent of internal structural change that would be required to shift to an export orientation.

> ...the essentially one-sided approach of the Commission to the expansion of exports causes it to underestimate the extent of the internal transformation of the South African economy which is required for exports to lead growth. Again and again the Commission tentatively considers various aspects of the matter, notably in the chapters dealing with production costs, fiscal measures, finance, and transport. Nevertheless it does not fully accept the proposition that domestic economic changes are the essential precondition for increased exports and for sustained growth.

In response, Reynders (1975, p.123) argued that it would be the implementation of export incentives that would lead to the structural changes, not the reverse.

> ...my fundamental hypothesis is that the newly introduced export incentives have in fact introduced a structural change in the whole of South Africa's export environment. However, since this is a very recent change; since the package of incentives is not yet complete; and since the understanding and acceptance of the new package has not yet worked its way through to all exporters and potential exporters, it is rather premature to look for a statistical quantification of the extent of the change which I am hypothesizing.

To date there has never been an adequate analysis of the impact of these policies. More than a decade later,

the same debate was played out between policy makers in the BTI (1988), who proposed industrial restructuring, and IDC (1990), who supported export incentives to induce structural change (see below). It is thus unlikely that the effect of 37E and GEIS export incentives will ever be separated from other policy initiatives.[3]

In any case, Government rejected Reynders' call for a cabinet committee on exports and for a White Paper which outlined official positions and strategies on export oriented industrialisation. Instead, it appointed an interdepartmental committee on exports consisting of heads of relevant departments. The private sector at the time was represented on the state's Private Sector Export Advisory Committee.

Despite Reynders' wide ranging recommendations on raising manufacturing exports, no diversification away from the MEC took place in the 1970s. Instead, the very reverse occurred after the gold/energy price boom after 1973 increased industrialisation around the MEC, (figure 1.6). These industrial policy decisions were partly IDC-led, including Sasol II and III, Escom expansion and Armscor. They were increasingly propelled by the growing interpenetration between English and Afrikaner capital in specific sub-sectors. For example interpenetration in the coal industry facilitated the development of large-scale coal exports.

The increasing dependence of the economy on the MEC became apparent by 1975. Main (1975) and Zarenda (1975) attributed this to the fact that Reynders had not focused adequate attention on the internal structure of the economy. Zarenda (1975, p.117), while agreeing on the need to bring down tariffs gradually, pointed out that

[3] The Section 37E amendment to the Income Tax Act allows an investor to accelerate the depreciation on new investments, subject to certain conditions. The General Export Incentive Scheme (GEIS) provides varying rebates on the exports of commodities. Rebates increase in accordance with increasing complexity.

protection was more complex and that it would be more useful to use effective rather than nominal measures of protection, mainly because past policies had favoured intermediate input and capital goods imports. This had the impact of masking very high levels of effective protection, emphasising the lack of cohesiveness of tariff policies.

Main pointed out the linkages between mining, mineral processing and other manufacturing, and was concerned with the failure to accord equal state incentives to each, particularly around mining taxation. He described how mineral processing was hampered by a small local market, low capital returns, high freight charges, inadequate port loading facilities, difficulty in competing with developed market producers and penetrating their markets and a shortage of skilled labour.

Despite Main's criticisms, many segments of the MEC benefited from Reynders' recommendations. A 20% power subsidy was allowed to the ferro-alloy industry in mid-1974, retrospective to October 1973, and contributed to the growth in ferrochrome exports. Government implemented a number of recommendations including finance charge aid to exporters of some minerals, but rejected private sector proposals to lower export finance charges below domestic interest rates in a scheme which involved the Reserve Bank raising off-shore loans. Instead, the South African Reserve Bank (SARB) allocated R95m per annum for foreign exchange forward cover losses during 1973-4, and the IDC allocated R40m per annum to subsidise export production capacity creation. Some of Reynders' recommendations on transport were also implemented. Rebates were granted on the transport of unprocessed or semi-processed raw materials destined for export either directly to ports or via processing plants. Government also increased tax allowances on market development

expenditure, capital investment, initial allowances and beneficiation allowances.

Thus, when viewed in the context of social, political and economic forces of the day, it is not surprising that a selective implementation of Reynders' recommendations occurred, one that benefited and enhanced the MEC over and above non-MEC manufacturing.

1.6 INDUSTRIAL POLICY IN THE 1980s - THE KLEU REPORT

By the 1980s the disjuncture between English and Afrikaner capital had largely been eroded, manifesting itself in increasingly influential economic roles played by Sanlam and Rembrandt. By the late 1980s, increasing conglomeration and interpenetration were being accompanied by the privatisation of state corporations, such as Iscor and Sasol.

The policies of the 1970s that supported the MEC had led to a cul-de-sac once the benefits from the gold and energy boom of the 1970s were exhausted. The economic crises of falling global demand for MEC exports and the structural impediments to diversification out of the MEC core overlapped with the political crises of apartheid. Ironically, just when conditions were most conducive for the adoption of coherent economic policies for diversifying out of the MEC, the state was unable to effect them, subordinating policy to counter the post-1985 debt crisis. For example, Kahn (1991) has shown that resulting exchange rate movements had differential impacts upon the profitability of one sector as opposed to another depending upon their relative dependence upon imports for their inputs and exports for their outputs.

It was perhaps because MEC growth adequately sustained the economy for much of the 1970s, that the next official inquiry into the state of South African

industry reported only ten years after Reynders, in 1982. The time that it took for the Kleu Report to be produced, indicates both the limited inherited expertise and research on which the Study Group was able to draw as well as the limited urgency with which industrial policy was being treated. The Study Group was set up in 1977, its deliberations emerging in 1982,[4] and a White Paper on industrial policy only in 1985!

Kleu's lack of realism and the Report's ideology is apparent from its opening page, p.1:

> It must be said at the outset therefore that an industrial strategy for South Africa must be determined within the framework of a system in which free enterprise, consumers' freedom of choice and private ownership play a fundamental role.

In effect, the Report did point to a broad framework for the formulation of industrial policy although this was ambiguously, if not inconsistently, combined with a commitment to "the private entrepreneur to decide what he will produce, how much he will produce and how and where he will produce", pp.317-8 - even if subject to indicative planning. As such, the Report suffers from two drawbacks. First, it is so general as to be meaningless except as a statement of good intent; we are given little indication of what, how much, how and where he is liable to be producing either within any one sector or across them. Second, by the same token, the recommendations have been studiously ignored in practice, having themselves been based on an analysis that has placed little attention on the political and other forces that had in the past shaped the path of both industry and industrial policy.

[4] Even so, the Report is itself poorly produced, with many publishing errors.

Joffe (1987, p.1) detected a shift away from state intervention in industry in the rhetoric of the Kleu report, interpreting this as a reflection of a global trend towards liberalisation. This process, in fact, began in the early 1980s when the state liberalised the financial sector, an act which, by itself, failed to give impetus to the industrial trajectory. Instead it heavily benefited the cash-rich mining conglomerates, rather heralding speculative booms, capital flight and accelerating imports. More damaging policies to confront a subsequent fall in the gold price would have been difficult to design even in retrospect! Yet Moll (1992) suggests that macroeconomic policy was successful, given the "exogenous" constraints under which the economy operated.

Even before that, Kleu (1973) had argued for policy to enhance competition by reducing government interference in the economy and shifting towards a more even balance of support between import-substitution and export promotion. Greater productivity increases were to be encouraged through the startling measure of initiating studies by the NPI in collaboration with industry.

The Kleu Report, whatever its other deficiencies, examined industrial policy from a wide perspective, just as its predecessors had. The Report called for a balanced promotion of exports and import replacement, a more vigorous effort towards decentralisation, enhanced labour skills and a concerted technological policy.

Kleu's "multidimensional" view of industrial policy, recognised the proliferation of responsible government agencies and called for a coordination both between these various agencies and with the private sector, implicitly recognising how this had been absent in the past, p.318:

> At present a number of bodies naturally share the task of dealing with numerous policy aspects that influence industrial development. These bodies include the Department of Industries, Commerce and Tourism, the Board of Trade and Industries, the Decentralisation Board, the Competition Board, the Economic and Physical Planning Branches of the Prime Minister, the Department of Manpower and Finance, the South African Reserve Bank, the Industrial Development Corporation, and others.

However, with the exhaustion of MEC revenues in the early 1980s, coupled with the crisis of apartheid, industrial policy coordination, never cohesive in the first instance, evaporated further. Firstly, Kleu's narrow vision of "industry" excluded mining and energy sectors which had long been coordinated through the Chamber of Mines and, more recently, in conjunction with the Department of Mineral and Energy Affairs (DMEA). An attempt had even been made to extend coordination to mineral processing. Reynders' proposal in 1972, to reduce imports of intermediary and capital goods while raising sectorally targeted exports, necessitated continuous monitoring of the latter and the Minerals Bureau was set up in 1972 to monitor mineral resource management and mineral processing, Main (1975, p.109).

Secondly, the responsibility for coordinating energy policy concerning liquid fuels rested with the DMEA, although Sasol and its creator, the IDC, also played decisive roles. Thirdly, and most importantly, responsibility for industrial policy for most "other" industries (non-MEC) fell to the DTI and, in particular, to the BTI whose tariff policies were both diffused across MEC and non-MEC sectors and were also uncoordinated with MEC policies.

1.7 INDUSTRIAL POLICY IN THE 1990S - THE DEMISE OF THE BTI

Industrial policy in the 1980s cannot simply be described as a shift from an inward to an outward focus. In fact, industrial policy thrusts around the MEC, through creating and supporting large-scale MEC industries, continued. While some Escom projects were postponed because stagnation reduced electricity demand, the coordinated strategy around liquid fuel energy continued. Shortly after the release of the 1985 White Paper on industrial policy, the Cabinet evaluated several private and public corporation proposals for developing the nation's offshore gas reserves and the Mossgas proposal was selected. This IDC-led mega-project involved the transfer of Sasol's technology and provided a major short-term boost to the economy between 1988 and 1992.

On the other hand, the economic crisis of apartheid, particularly after the 1985 debt crisis, began to have an impact on the uncoordinated trade policies of tariff protection. Lacking an overall economic rationale and coherence as well as being disconnected from other aspects of policy, tariff policy through the BTI had been reactive to the individual levels of profitability of domestic industry even if apparently more stringently applied over the most recent years. Levy (1992) takes the fate of applications to the Board as an index of "its responsiveness to entreaties from the private sector". 65% proved successful in 1987, compared to 40% in 1988 and 20% in 1989.

In the late 1980s, the Board of Trade and Industries attempted to reduce tariff protection substantially by linking this to interventionist (and inappropriately named) structural adjustment programmes (SAPs) sector-by-sector. This was in part to ease the path of adjustment but, more significantly, to secure

productivity increase without relying exclusively upon the competitive coercion of the market.

In the BTI (1988) view, the decline in the economy's performance, as measured in terms of GDP growth, was due to several factors. First, despite Reynders' (1972) emphasis on export promotion, South Africa did not adjust its exports away from primary commodities ("stage 1" goods) in response to falling real prices and increasing world imports of advanced technology products ("stage 4" goods). Second, low productivity, high capital intensity, low personal savings and high tariffs were contributing factors as were currency overvaluation which occurred between 1979-1983, p.37. Using the negative trade balance of "stage 4" complex manufactured goods as an indicator of poor industrial performance and orientation, the BTI crystalised the debate over policy orientation at the time into three alternative options, p.42:

a) liberalisation through removing tariff protection
b) simulating a free trade regime in the belief that this, by itself, would shake industries into competitiveness. The envisaged instruments were tax rebates on industrial inputs or the adoption of export processing zones.
c) adopting a sectorally targeted strategy which supports industries while tariffs are gradually lowered, p.47.

The last option, or SAPs, were favoured by the BTI. In essence, these;

> would fundamentally be founded on principles similar to those underlying tariff protection and would, therefore, essentially also exhibit similar characteristics (except for....various forms of assistance pertaining to the different functional areas of business and different competitive factors). In short, it embraces an

infant industry approach to export development assistance, p.48.

However, with the continued stagnation in South African manufacturing throughout the 1980s and into the 1990s, two important influences have altered ways of thinking about future industrial policy. First, the prospect of a post-apartheid government has opened up a Pandora's box as far as analysis, policy and strategy are concerned. Theory and experience from many different sources have greatly enriched the terms within which South Africa's past, present and future manufacturing performance is being assessed. Second, as a specific and central example of this, the success of the NICs has exposed the limited terrain upon which South African industrial policy has been both conducted and discussed.

The pressure for action in the face of economic stagnation was most acutely felt by non-MEC sectors and by their coordinating institution, the BTI. Here, the sectoral SAPs proved less acceptable, especially to the Department of Trade and Industry even if it was more amenable to tariff reform (i.e. reduction). As Levy (1992) quotes from the Department's Annual Report for 1989, pp.17-8:

> The Department experienced problems with the acceptance of the BTI's first recommended "structural adjustment programmes" ... government policy implies the reduction of state involvement with the activities of the business sector - not an evergrowing involvement.

It was followed in 1990 by the DTI withdrawing ninety personnel seconded to the BTI, crippling the latter's SAP work. Simultaneously, new SAPs were forbidden by the Trade and Industry Minister.[5]

[5] Business Day 14-6-91.

The IDC appears to have stepped into this policy vacuum, publicly challenging the BTI's interventionist approach. The IDC (1990) attributed the problems of poor industrial performance to tariff policies, which were administered by the BTI, p.1:

> For almost 70 years, the industrial development policy of successive governments was based on import replacement.

In its recommendations which were more in keeping with the liberalising elements of the Kleu Report,[6] the IDC conveniently ignored its own interventionist role in creating and nurturing a range of MEC industries which, it is argued here, played a greater role in shaping South African industry than tariffs. There is also an astonishingly frank, but possibly unconscious, recognition of the limited scope of what it perceived as constituting industrial policy; it is effectively identified with trade or, more exactly, BTI-administered protection policy. As if as a matter of terminological convenience, p.1:

> In this report the terms "trade policy" and "industrial policy" are used synonymously and interchangeably.

The logic lying behind the IDC's push for greater export orientation is that protection policy is mere

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[6] For a review of the IDC report along the lines presented here, see also Black (1991). He sees "a key instrument of industrial policy is the availability of long term capital and that this has to be made available on a concessionary basis to targeted sectors", p.17. This raises a number of issues. By what criteria are those sectors to be selected, how are they to be identified given those criteria and, if this can be done, why should intervention not be more extensive (and not necessarily centred on cheap finance which serves more as a mechanism of implementation of policy) to guarantee the realisation of goals within the firms and sectors selected for the economy more generally. In short, Black appears to substitute selective finance for trade policy as the Midas touch in the formulation of industrial policy. This is all the more remarkable given his correct emphasis on the need, drawing upon South Korean experience, to create comparative advantage. See Black (1990) where he draws similar, if more general, conclusions to our own concerning the scope of industrial policy and the lessons to be learnt from the Asian NICs as a consequence.

featherbedding of inefficient industries which need to feel the coercion of competition to shake them out of a low level of performance; industries are not expected to be infants for 70 years. Such logic fails to recognise that, irrespective of the presence of such competitive pressures, there is also the incentive to reduce costs in order to enhance profitability and, more pragmatically, removal of protection may have the effect of eliminating the fittest enterprises without necessarily inducing the entry of alternative producers in the same or other sectors (except from abroad). But bend the IDC must to international pressures, and it recommends a progressive reduction of import duties and surcharges to bring about a more uniform and lower level of protection in line with the fashion for export orientation. Equally significant, the stiffening attitude to protection almost certainly reflects a shift in the balance of internal economic interests and political balance. Favour has swung away from small-scale (never highly supported), Afrikaner manufacturing towards large-scale corporate, MEC activity. It is also apparent that the large-scale mega-projects currently being put in place - under the imperative of generating foreign exchange - incorporate a logic arising out of their capital-intensity, that places them more readily outside the reach of organised labour and the state other than in the form of an incorporated and elite-based dependence. This is all the more remarkable given the desperate need for labour-intensive job creation through state expenditure.

The exact incidence of support across sectors, and its determinants, requires further study. The shifts in balance are themselves masked by limited coherence in policy and the more general withdrawal of support to all as a response to economic stagnation. While the BTI (1988) proposed sectorally based adjustment programmes, the IDC (1990) favoured a three-pronged approach. First, reduce tariffs, the basis of BTI's discretionary power.

Second, support export oriented capital investment through tax incentives. Third, target industrial sectors which offer static comparative advantage, in particular, mineral beneficiation industries. The policy disjuncture, not entirely dissimilar to the debate between Reynders and Ratcliffe in the mid-1970s over the sequencing of restructuring measures, was publicly highlighted by BTI Chair, Lawrence McRystal in a newspaper article entitled, "Industry must be restructured before tariffs are lowered".[7] After this last ditch stand, McRystal resigned in August 1991 and the BTI was emasculated by the BTI Amendment Bill of 1992.

Thus, after apparently occupying centre stage in industrial policy for much of the 20th century, the BTI was renamed the Trade and Industry Advisory Board in 1992, and its functions were curtailed to advising the Trade and Industry Minister on tariffs and dumping duties.[8] Even so, in 1993, it is the IDC that appears to be providing the basis for South Africa's tariff position at the GATT negotiations.

In the 1990s, with the demise of the BTI, the IDC administers the only significant pro-active industrial policy, namely the promotion of an industrial trajectory around the MEC, supporting large-scale mega-projects including Sasol's expansions, aluminium smelting, stainless steel and potash. The only difference is that the process is now driven by private sector interests.

Discretion still remains at the heart of decision making as in the selection of projects qualifying for Section 37E tax incentives, the subject of opposition by senior officials of the Finance Department.[9] Section 37E incentives initially, in 1991, covered projects

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[7] Business Day 17-7-91.

[8] Business Day 3-3-92. Previously, the BTI made recommendations directly to the Finance Department, bypassing the Trade and Industry Minister.

[9] Business Day 2-8-91.

beneficiating locally sourced minerals. It susceptibility to the powerful coalition of private sector interests around the MEC is evident in its extension, in 1992, to projects beneficiating imported material, in particular the Alusaf project, which did not previously qualify because it utilised imported alumina.

But of more interest, however, are the exceptions that the IDC (1990) brought to the fore. Apart from acknowledging that some sectors will adjust to tariff reduction with greater difficulty than others according, for example, to the level of previously sunk capital, and acknowledging the case for inward industrialisation, the report also emphasised the need for, what might be correctly termed, industrial policy for capital goods, p.25:

> The active promotion of capital goods manufacture is therefore a desirable direction for development in the long term ... in a modified trade policy, new development, including capital goods manufacturing, must be actively promoted but with less reliance on protection alone and greater use of pragmatic and innovative development schemes.

Like many previous recommendations for diversification out of the MEC core, such "active promotion" has never been carried through even if clarity has yet to emerge on what is meant by being "pragmatic and innovative". Given the orientation of the IDC and the strength of private sector interests around the MEC core, it is unlikely that any sectors falling outside the core will be "actively promoted".

The most recent official policy document, the Normative Economic Model, Keys (1993), confirms this. It represents a synthesis of a model developed by CEAS

(1993).[10] CEAS firstly adopts an incorrect and essentially false framework to conceptualise productive economic sectors. The model bases its analysis on a traditional conception of the economy, dividing it into primary (mining and agriculture), secondary (manufacturing, construction and electricity) and tertiary sectors (transport and communication, financial services and social services). The sectors are essentially treated as independent entities, with the policy objective being to shift, according to the aggregated international developed market economy norm, away from the primary sector. There is no recognition of interlinkages and interdependence within the MEC core sectors (Chapters one and two) and, furthermore, the model incorrectly interprets industrial development as having followed a path of ISI (see critique of ISI below), p.301:

> The development of the manufacturing sector in South Africa during the 1960s and 1970s is typical of a country that has adopted an import replacement strategy. This strategy implies a progression from non-durable to durable consumer goods and then to highly sophisticated intermediate products and capital goods. Measured against the objectives of such a strategy, the results achieved cannot be considered a clear success.

Secondly, the model considers only a narrow range of factors which have contributed to the pattern of industrialisation. The problems of the economy are interpreted in terms of capital- versus labour-intensity at a level so highly aggregated as to render the analysis meaningless, p.42:

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[10] The ineffective role of the BTT, the successor of the BTI, is evident in its apparent lack of participation in developing the synthesis document.

> The capital or labour-intensity of the economy is dependent, inter alia, on the country's production structure, on the one hand, and the production and management techniques as determined by the stance of the technology, on the other. The production structure is, in the first instance, a function of the composition of the demand for South African goods and services, which in its turn, is subject to changes in the pattern of income distribution.

These are inappropriate analytical tools to interpret causality in the process of industrialisation. The economy's high capital-intensity is attributed to inappropriate state-led investment in strategic projects, p.44, as well as low nominal interest rates in the 1970s, p.14. Although the model only considers industrial development after the 1973 gold and energy price rise, figure 1.6 shows the capital-intensive pattern to have been evident from the inter-war period. Alternatively, the CEAS argues, in an apparent tautology, that economic stagnation was due to low levels of investment in the 1980s, p.25, which fell because growth fell, p.27. This led state sectors to cut capital expenditure in a regime of stricter fiscal discipline after 1980, p.28. Clearly this is descriptive rather than analytical.

Thirdly, the conduct of past policy is only superficially examined. Its failure to be cohesive, the problems of poor monitoring and its determination by social and political factors is ignored, p.289:

> in the past, the manufacturing sector in South Africa was stimulated by means of large-scale investment in capital-intensive, import-replacing and export-oriented industries. Another characteristic was the high level of protection that was granted to specific industries producing mainly for the domestic market.

The proposed CEAS corrective policies are defined at a highly aggregated macroeconomic level. It identifies two problems which policy has to overcome, first, the failure to specialise in specific exported manufactured products and, second, declining factor productivity, which the model only measures at an aggregate level.

Without any substantiation of its differing impact at the sectoral level, the model assumes that an outward-oriented policy will automatically lead to improved productivity ratios and increased exports simply because of the resulting increase in competition. The net impact of such an approach is the reduction of tariff protection and the abandonment of the sector concerned to market forces.

Keys (1993, p.15) further develops the criterion for selectivity, subordinating them to more abstract macroeconomic ideological objectives.

> The extent to which selective assistance to particular industries will be needed, depends largely on the tempo at which policies such as the phasing out of exchange control, the lowering of tariff protection, cooperation in wage bargaining, price competition and fiscal and monetary discipline in general are realised. Progress in these areas would reduce and possibly even eliminate the need for selective assistance to industries with proven competitive advantage, such as in agriculture, mining and minerals beneficiation. The instruments to be used over a broadly defined spectrum of more advanced industries, probably mostly category 3 and 4 products of the GEIS, and should meet the criteria of investment, employment and efficiency in their impact on development.

While Keys expects a free-trade regime to benefit the primary and processed commodity sectors, its impact on the rest of the economy is unquantified, (even in CEAS (1993)). Those that do survive the shocks of liberalisation may or may not be supported, depending on some discretionary judgement at that time.

To conclude, little has changed in the problems hampering manufacturing industry growth that were identified back in the 1960s. These then included skills, training and research development deficiencies and the need to target beneficiation and exports:

> (South Africa) must step up and step up rapidly its secondary and university training and adjust and direct it more towards the exploitation of the economic potential of the country. In particular the country should train scientists and engineers to a considerably greater extent and with much more deliberateness than has been the case up to the present. The country's engineering facilities should be strengthened and the State should make available substantial funds for attracting deserving students to such training. Norval (1962, p.25)

> It is imperative, too, that the country's research programme should be stepped up and that it should be more purposefully directed towards the development and exploitation of such resources in the country in respect of which it has the greatest potential and comparative advantage for taking advantage of foreign markets. Norval (1962, p.27)

> The country needs to become far more outgoing in search of foreign markets and more aggressive in its salesmanship in the

> development of such markets than has been the case hitherto. Orders much be fetched, they do not come to the timid. Norval (1962, p.28)

Three decades later, the same warnings and recommendations by Norval are being dusted down and recommended in Keys (1993) and CEAS (1993). Yet the obvious question of why these warnings were not heeded thirty years ago has rarely been addressed. The reality is that such general prognostications serve to veil a continuing lack of coherence and commitment in industrial policy and, more sinisterly, the desire to retain the ability to respond with discretion to shifting, uneven and fragmented economic and political imperatives.

2. PERCEPTIONS OF INDUSTRIAL PERFORMANCE

2.1 INTRODUCTION

There have long been fierce debates over the successes and failures of South Africa's industrialisation. These have evolved and exhibited a rhythym corresponding to the perceived performance of the economy itself, although protagonists within South Africa have often picked up and run with the analytical batons passed on by those following the fashions of externally determined theory. The shifting marriage forged between internal empirical developments and external theory has given the debate a dynamic that has apparently endowed it with a progressive evolution. This is dramatically illustrated by the Pandora's Box of analyses that have been opened up by the prospects of a post-apartheid economy. Drawing upon a range of experiences and strategies from other countries and their corresponding intellectual baggage, an astonishing variety of industrial strategies has been proposed. This stands in sharp contrast to the previous, now supposedly sterile, debate over whether apartheid had been functional or not to South Africa's economic development and, subsequently, why had it proved incapable of sustaining itself.

Despite these swings in the content and the terms of the debates, the intention here is more to stress what they have had in common. Unfortunately, the apparent sensitivity to the most immediate empirical developments has been misleading in so far as the deep-rooted realities of the economy have, paradoxically, been overlooked. This is, in part, because of a lack of attention to detail in terms of what has actually constituted industrialisation in the South African context. And it is also due to the failure to acknowledge the underlying economic forces that have driven industrial policy.

These deficiencies have been reinforced by dependence upon external theory. For, beginning with Rostowian notions of industrial transition, South Africa's performance was judged on the basis of a programmatic sequence, the notion that manufacturing would ultimately be self-sustaining. Although such determinism has long since been discarded,[11] some of its nostrums have persisted within the continuing debate. In particular, the idea has persisted that industrialisation will take the form of backward integration from consumer goods with a declining role for the primary sectors of the economy, made up predominantly of agriculture and mining. The issue of industrialisation has continued to be very much one of how far this process has or has not gone and why.

The perspective from which we assess this literature is diametrically opposite. First and foremost, the South African system of accumulation has been dominated by the core activities of mining and energy but increasingly incorporating other directly integrated manufacturing such as processed minerals and chemicals. Secondly, the extent of the MEC across the economy has been more or less limitless since, in corporate structure, it has been highly concentrated around mining houses, each of which has owned its own finance house, and these have been engaged in acquisition and mergers. In addition, private corporate capital has been heavily integrated with parastatals.

Third, the broad categorisation of the economy into sectors such as primary and manufacturing has been extremely misleading since much of the latter, from an analytical point of view, does not correspond to industrialisation in the sense discussed above (backward

[11] Although this still essentially applies to Government thinking in its reports on industrial policy and performance, see section one of this chapter.

integration from consumer goods). Rather, industrialisation has primarily been based upon forward integration from the core activities of the MEC. Consequently, industrialisation should be debated in terms of the reasons why this has not proceeded further. As a corollary, the notion that South Africa has failed to make the step from ISI to international competitiveness is equally misguided. For the greatest part of industrialisation that has been achieved has been related to core MEC activities that have served both domestic and foreign markets, whether directly or indirectly.

2.2 ROSTOWIAN DETERMINISM

Many analysts were blinded by the spectacular growth of the aggregated manufacturing sector, relative to mining and agriculture, in the 1950s and 1960s, (figure 1.1). Falling growth after the 1970s was initially seen in cyclical, rather than structural, terms. Houghton (1973, pp.130-136) writing before the crisis in the South African economy became fully exposed, was optimistic over the prospects for industrialisation. In Rostowian fashion, he regarded "take-off into self-sustained growth" as having been achieved between 1933 and 1945, with the economy engaged in "a drive to maturity" ever since.

> According to Rostow, economic maturity is reached some sixty years after the take-off begins. If this holds true in South Africa's case the national economy should be reaching maturity about the year 1990! Houghton (1973, p.18)

By the early 1980s, flagging growth was attributed to low productivity, poor economic management and ISI trade policies, preventing a shift to an export

orientation in the 1960s. Yet, Viljoen (1983, p.33) still maintained that "South Africa is clearly approaching the stage of industrial maturity".

> On the whole South African manufacturers were more interested in exploiting the protected and rapidly expanding local market than in competing in the highly competitive overseas markets. They were also penalised by the internal location of the main centre of industrial activity. Viljoen (1983, p.47)

He observed the "remarkable fact" that growth was based on the combined use of more factors of production rather than on increased output for the same inputs, attributing this failure to "the quality of management" Viljoen (1983, p.42). Such problems were expected to be overcome over time by the formation of the Productivity Advisory Council and the National Productivity Institute in 1967, "experience has been that improvements in productivity is a long-term problem of many dimensions that can be solved only over a considerable period of time." Viljoen (1983, p.48)

Rostowian positions did not go much beyond this in explaining why industrialisation, itself perceived in highly aggregated terms, had not been more efficient nor penetrated deeper. Although Viljoen recognised the disproportionate weight of steel and chemicals in the economy with the future potential to develop downstream linkages, there was no explanation of why this had not occurred. In the case of the motor industry, its low productivity was not attributed to poor management, but to its fragmentation, which impeded the achievement of scale economies.

Viljoen (1983, p.51) simultaneously pointed to the high and growing concentration in ownership of the

manufacturing sector, but drew few conclusions about its impact on the pattern and process of industrialisation except that it "naturally raised serious issues in regard to the maintenance of competition and, ultimately, of the free enterprise economy." Here conglomeration was viewed as a potential impediment to industrial growth, rather than as result of a particular form of industrialisation.

2.3 LIBERALISM CHALLENGED

In the face of flagging industrial performance during the 1980s, Rostowian optimism began to give way to a view that attributed industrial failure to the impediments imposed by apartheid. For Kaplan (1977), the second world war promoted manufacturing, especially in textiles, metal processing and engineering, and gave rise to a bimodal structure in the size of manufacturing firms; the large-scale open to a degree of foreign control and dependence, the small-scale particularly dependent upon protection. But, in his view, economic policy was primarily concerned to promote the interests of mining and agriculture (as a compromise between English and Afrikaner interests).

This is a judgement that is difficult to sustain on balance without a detailed study across different sectors of the economy. Even then, there is the problem of whether the distinction between the identified fractions of capital can be so sharply demarcated. Just as there is a necessary relation between state corporations and the mining sector, so the latter increasingly incorporates manufacturing. Cartwright (1964, p.221), for example, highlights one consequence of the development of the new goldfields in the Orange Free State after the war:

> The chairman and directors of African Explosives and Chemical Industries ... were quick to grasp what was happening. The steps they took in those days were

> eventually to increase the issued capital of the company to no less than £29,000,000 and to make it the biggest manufacturing enterprise in the country.

It merely needs to be added that AECI had long been substantially under the control of Anglo-American; Ernest Oppenheimer chaired it almost to the day of his death in 1957. Subsequently, it necessarily occupied an integral part in the development of the heavy chemicals in conjunction with Sasol. Cartwright's narrow conception of manufacturing ignored the far larger capital investment of £41m in state-owned Sasol by the end of the 1950s.

For liberals, poor industrial performance reflected the intensified constraints imposed by apartheid upon market forces and, for Marxist-revisionists,[12] the crisis of the apartheid system that was previously functional for capitalist profitability. A compromise position is possibly to be found in the stance of Nattrass (1988). She sees state intervention from 1924 onwards as having shifted the economy "to develop in its own right and on a broader basis than that of the mining industry alone" to become "something more than a peripheral area in the British Commonwealth", p.232. However, it also entrenched white privilege so that the positive impact on industrialisation had to be set against the economic inefficiencies and injustices associated with apartheid. In short, Afrikanerdom is seen as essential to break out of underdeveloped dependence on foreign capital, but its associated state intervention, especially in the labour market, had become increasingly dysfunctional to economic performance.[13]

By a range of criteria, Moll (1991), inherently rejecting Rostowian determinism, has argued that the South African economy did not perform well in the

12 See for example, Wolpe (1972) and Johnstone (1976).
13 See also Nattrass and Ardington (eds) (1990).

post-war period, even before the 1970s, so that the economy might be better considered to have been in a prolonged slump. His attention focuses on growth rates, relative both to other countries and to South Africa's own past experience, productivity growth and the contribution of exports.[14] Whatever the merits of his empirical account, it still leaves open the issue of why the economy should have failed. For example, the following offers more of a description than an explanation, p.283:

> Manufacturers were protected from some import-competition by a variety of direct controls and tariffs, and had access to cheap capital good imports. Not being encouraged to compete internationally via exports, they settled down to enjoy internal markets and in some cases returns to scale could not be achieved. Many "infant" industries seem never to have grown up and required tariffs and protection decades after being started. The "easy" stage of import-substitution in light final and intermediate goods industries ended in the early 1960s, but possible shifts towards exporting light manufactures and the efficient production and export of capital goods (for example mining equipment) did not take place. Meanwhile, there is abundant evidence that many state industrialisation initiatives were inefficient (for example Sasol) or misguided (the industrial decentralisation policy).

Essentially, the argument is that the tempering of market forces and the inadequacy of state intervention were at fault. But why should protection not lead to take-off? Indeed, limited domestic markets and access to imports might imply intense competition rather than featherbedding. And, given extensive state economic

[14] See also Nattrass (1989a and b) and (1990) for an account of the falling South African economy based on falling profitability from the 1960s. Some doubts are cast on these calculations in view of (profit in the form of) capital flight, Kahn (1991), Rustomjee (1991) and Smit and Mocke (1991).

intervention, why should it not have been more conducive to growth?

In his thesis, Moll (1990) ultimately offers a number of explanations without claiming to be comprehensive. These divide into two sorts. First, there is appeal to restrictions in the labour market, created by the commitment to apartheid, whether it be in the (geographical, sectoral and occupational) immobility of black labour or its limited access to informal (self)-employment and to state-provided education and training. Second, there is the argument of inappropriate economic policy within the confines of the apartheid labour system. In particular, devaluation of the rand would have proved more favourable to export of manufactures. He points to the separation between trade and industrial policy as well as the separation between each and the conduct of balance of payments and exchange rate policy, p.142:[15]

> Balance of payments and exchange rate policy was seen as the preserve of the South African Reserve Bank, its aim being to deal with monetary flows ... Industrial policy was dealt with by the Board of Trade and Industries, largely using tariff and decentralisation policy. The linkages between trade and industrialisation seem never to have been explicitly considered on either side.

Moll suggests that the reason for this compartmentalisation of policy is to be found in the short-term relationship between the exchange rate and the distribution of income and the favour to be bestowed on underlying economic interests. In short, devaluation would have enhanced the position of black workers since they were disproportionately employed within the traded

[15] Moll (1990) quotes an interview with Simon Brand, "Dr. M.H. de Kock, Governor of the Reserve Bank, would have been horrified if the Board of Trade and Industries had come to him in the 1950s and asked him to devalue to encourage industrialisation".

sector, as opposed to the whites predominantly within non-traded, particularly state, employment.

Such a view is problematical. Firstly, it ignores the role played by the IDC, attributing credit for industrialisation almost solely to tariffs administered by the BTI. Secondly, it presumes that the separation between arenas of policymaking and the content of policy is primarily determined by the distributional interests of different fractions of workers. It also sets aside the other factors determining the distribution of income and levels of wages and employment. Should export promotion have proved so favourable to black workers, the evidence is that compensating adjustments could well have been adopted by the apartheid state to support white workers. More generally, the problem with Moll's counterfactual arguments is that they are almost inevitably dependent upon very heavy ceteris paribus assumptions. The economy would have performed better with more skilled and less fettered black workers, and with exchange rate policy more favourable to exports. But the economic and political conditions to allow such policies to be put in place would not have allowed such ceteris paribus assumptions to hold. The skill composition of the workforce and the structure and content of policymaking were themselves products of the underlying balance of economic and political forces.

Similarly McCarthy (1988, p.21) finds it easier to identify than to explain South Africa's economic malaise:

> It would appear that South African industrial development has reached an impasse. Import-substituting development has taken the manufacturing sector a long way up the ladder of development but has not lowered the average import propensity of the economy. In order for this to happen large-scale replacement of intermediary and

capital goods will be required, a development which is accepted to be difficult and costly in the comparatively small market.

Here, we find a number of commonly cited factors for South Africa's difficulty in promoting further growth in manufacturing; a structural obstacle to further industrialisation, which has exhausted the scope for import-substitution, continuing import dependence especially as a consequence of weak capability in capital and intermediary goods, and the constraints imposed by the level of domestic demand.[16] As such, it leaves unanswered a number of questions, not least why the industrialisation that has taken place should not have gathered its own momentum, whether through spin-offs into other linked sectors or through the attainment of international competitiveness and export growth (especially given dependence upon limited domestic markets). As South Africa's export performance has been dramatically poor in manufacturing, with export growth limited to processed minerals and chemical sectors, the notion of insufficient demand cannot legitimately be isolated from consideration of export markets. Why could these have not be sought out and captured?

2.4 SCHUMPETERIAN INTERPRETATIONS OF INDUSTRIALISATION

Poor economic performance is also reflected in perceptions of technological underdevelopment, based on Schumpeterian paradigms (for example see Fransman and King ed.(1986) and Rosenberg (1976)). Kaplan (1987 and 1990) points to the weakness of the capital goods sector, drawing upon the sub-sectors of machine tools and telecommunications. For the former, he argues that traditional explanations of failure based on limited markets and insufficient R&D are inadequate by themselves. He points in addition to the failure to develop indigenous design capability, insufficient

16 See also Archer (1987), Black and Stanwix (1987), Kaplan (1987).

protection and commitment to export markets and their ineffectiveness in view of exchange rate movements and the lag in the South African business cycle compared to other countries.

Meth (1990) takes a very different view. He emphasises the extreme diversity of the capital goods sector and argues that, given the structure of the South African economy, it is quite appropriate for it to import a large variety of capital goods and foreign technology, especially since these are used profitably in production for protected domestic markets, p.308:[17]

> South Africa has a competent engineering (capital goods) industry which is as large as one could reasonably expect. Given the size and diversity of the manufacturing sector, it is unrealistic to believe that a local capital goods industry could produce anything more than a narrow selection of the core machines required.

But why should those sub-sectors in which competence does emerge not also lead to international competitiveness and exports? And what determines which sub-sectors should benefit from competence? The two sectors - capital goods and telecommunciations - highlighted by Kaplan, for example, are very different from one another, quite apart from their own internal heterogeneity. Capital goods have in part had a close and longstanding connection with the core activities of the mining, minerals processing, chemicals and energy industries; the determinants of developments in telecommunciations have been very different, with much stronger links to foreign capital and technology and greater scope for diversification into new technology

[17] Meth is also concerned to question the notion of "appropriate technology", suggesting that this is only meaningful in the context of a more fundamental transformation of the economy, p.308: "A major restructuring of the pattern of demand (which is distorted by gross income inequality and South Africa's natural resource endowments) is required before the potential for a larger more "appropriate" capital goods sector can be realized."

around electronics. Such considerations raise the issue of how general an explanation for industrial success or failure, given the wide diversity of the sub-sectors concerned can be.

In the context of industrial development and industrial policy, it is more useful to avoid a narrow focus on capital goods and to consider the broad engineering industry as a set of heterogeneous and closely linked sub-sectors whose role it is to deliver capital goods, repairs and other services essential to the efficient functioning, reproduction and further development of core productive sectors. In the specific South African context, the engineering industry and, consequently, the capacity to produce capital goods, has failed to develop as a productive sector in its own right. This is not solely because of the reasons advanced by Kaplan or Meth. It is also associated with concentrated conglomerate ownership of the engineering and other sectors. These have tended to confine engineering's linkages to dependence upon mining, mineral processing, chemicals and energy industries. For those have historically absorbed a significant proportion of Gross Domestic Fixed Investment.[18]

2.5 MONOPOLY CAPITAL INTERPRETATIONS OF INDUSTRIALISATION

As with Schumpeterian perspectives, the trajectory of South African industrialisation has only been partially explained by those operating within the monopoly capital paradigm, which has also used and reinforced the dichotomy between "mining" and "manufacturing" which, we have argued, is misleading.

In rejecting both the liberal arguments of apartheid constraining industrial development and the Marxist-

[18] For a review of the engineering sector, see Rustomjee (1993) and Chapter six.

revisionist, view of apartheid being functional to the growth of all industrial sectors, Innes (1984, p.170) was less glowing in interpreting the achievements in industrialisation. He regarded it as being "relatively backward" for, even in the early 1950s, apartheid encouraged:

> a particular form of industrialisation based largely on labour-intensive methods of production. The immediate result was the expansion of the labour-intensive light industries rather than the more mechanised capital goods sector. For instance, during the early 1950s it was industries like food, beverages, paper and textiles that expanded (together with the more labour-intensive mineral processing group of industries), while in the late 1950s, when there was little growth, the trend to labour-intensity became more marked.

According to the model, diversification out of mining became possible through development of financial institutions, capital markets and a burgeoning credit system particularly after the late 1950s, Innes (1984, p.182):[19]

> What the growth of the local money market represented in particular was the clearest form yet of the merging together of bank capital and productive capital - that is, of the emergence of the phase of finance capital.

Thus, for Innes (1984, p.191) industrial expansion of a capital-intensive nature could only take place in the 1960s.

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19 As mentioned earlier, Innes has borrowed the concept of finance capital from the analysis of advanced capitalism, however much valid for that purpose.

As with ISI assumptions, the sequencing of events in reality does not fit the monopoly capital model. Investment in certain highly capital-intensive manufacturing industries has been a feature of industrial development since the late 1920s. By 1960, 35% of fixed assets in manufacturing were concentrated in just three MEC sectors, namely, steel, non-metallic mineral products and chemicals, (figure 4.3).

In summary, the monopoly capital paradigm, while describing the centralisation and concentration of the economy through the group structure of conglomerates with their historical roots in mining, offered a false explanation for the pattern of industrialisation and only partial reasons for poor industrial performance. Why, for example, did centralisation and concentration not lead to greater economies of scale and outward orientation and why did the economy stagnate in the 1980s, after "finance capital" had achieved even greater concentration and dominance?

2.6 REGULATION SCHOOL THEORY AND RACIST FORDISM

Poor industrial performance has been interpreted by Gelb (1987), through appeal to a variant of Regulation School theory.[20] His marriage of the external theory with internal empirical evidence adopts the seductively attractive terminology of "racist Fordism". Theoretically, the regulation school provides for the economy to sustain accumulation systemically until it enters a "structural crisis". The apartheid system gives the South African economy its peculiarly distorted form of Fordism, the predominant structure of accumulation for

[20] See also Gelb (1991) in which the racist Fordism approach serves as an uneasy, possibly reluctantly adopted, framework for the separate contributions. Most significant, in the rush to post-apartheid economic policymaking, the approach has sunk without trace, not least in Gelb's own work!

the post-war boom. Essentially, then, South African Fordism as the unity of mass production and mass consumption is doomed to run its course but only upon the restricted basis of mass consumption for privileged whites. Consequently, apart from relying upon a stereotyped version of Fordism as a system of accumulation, there is ultimately reliance upon underconsumptionism even if this is reinforced by appeal to the poverty wages of blacks. The theoretical and empirical underpinnings of the regulation school have already been extensively criticised for such leanings.[21] From our perspective, the notion of the South African economy as a restricted or distorted form of Fordism necessarily suffers from a reductionism of the apartheid system to the limited consumption of the majority (even if this is in turn related to the failure to sustain Fordist production) with, as in other contributions covered here, a neglect of the "Fordist" industrialisation that was in fact typical of production around the MEC core sectors.

[21] See Brenner and Glick (1991) and Mavroudeas (1990). The obvious question to address to the putative crisis of the racist Fordism regime of accumulation is why it should prove incapable of serving continuing expansion in privileged, white, domestic markets (especially given high import propensities and protection for domestic production of consumption goods) and/or serve export markets. It is worth observing that regulation theory has increasingly become eclectic and "middle-range" in which, for the latter, stylised empirical observations are interpreted as analytical structures which, not surprisingly, are more than capable of explaining the empirical evidence (from which they have been derived).

3. THE THEMES OF DEBATE

Debates have covered two trajectories. The first concerns the interpretation of the conduct of industrial policy. The second traverses the observed pattern of industrialisation and its associated performance.

3.1 INTERPRETATIONS OF THE CONDUCT OF INDUSTRIAL POLICY

The literature that is widely available on the formulation and conduct of industrial policy is limited, being partly if, as here, only literature in the English language is covered. This itself reflects a deeper problem, though one that is less relevant today. The economic disjuncture between English and Afrikaner capital has had a counterpart in academic debates over the content of industrial policy. South African industrial policy formulation and conduct has, until very recently, been the preserve of a handful of Afrikaner bureaucrats, academics and industrialists. Brand (1976, p.166) highlights this in passing:

> ...it is widely accepted that high growth rates of manufacturing output will continue to be essential. This assumption has occupied a central place in such forums for the formulation of government policy with regard to economic development as the Viljoen Commission (1958) and the Reynders Commission (1972), as well as in the spelling out of development targets in the successive Economic Development Programmes issued since 1963. It also features prominently in the writings of economists outside the official sector. Most recently, e.g. in T. Bell (1975).

The context of debate has thus been one where "unofficial" academics (our emphasis added) based at English-speaking institutions have usually criticised the

conduct of industrial policy from the sidelines relying upon the findings of numerous Commissions of Inquiry and parliamentary bills (from the preparation of which they have been excluded). Key milestones in this chronology include the Holloway Commission (1936), BTI Report No.282 (1945), Viljoen Commission (1958), Reynders Commission (1972), Kleu Report (1982), White Paper (1985), BTI Report No. 2614 (1988), IDC (1990) and the Normative Economic Model of 1993, Keys (1993) and CEAS (1993). As argued above, the analytical tools used have often followed the fashions of externally determined theory.

The issues concerning the conduct of industrial policy contained in the official literature across the post-war period have been outlined above. Essentially, three main industrial policy instruments were used in the post-war period. The first instrument, of creating state corporations and joint ventures with private capital, provided a major impetus to targeted core MEC sectors, thereby shifting the trajectory of the economy by the sheer weight of investment involved. The second instrument of tariffs was unfocused, reactive to various fractions of capital and poorly monitored and managed. There were no clear criteria for selectivity, nor the forging of complementary backward or forward linkages with the MEC core. Thus, tariff policy was uncoordinated with the first instrument, and often subordinated to protecting the balance of payments. Neither of these instruments was accompanied by additional supportive policies to overcome specific problems, such as skills constraints, technology access and appropriate research, identified as problems by various official investigations throughout the post-war period. The third instrument, industrial decentralisation, was poorly funded, uncoordinated with other instruments and doomed to failure given poor infrastructure and corresponding poor performance in the traditional centres of industry. Moreover, it was subordinated to the political

imperatives of apartheid, rather than being part of a coherent national industrial strategy, which in any case did not exist. It is against this background that the detail of industrial performance debates are examined.

3.2 INTERPRETATIONS OF THE PATTERN AND PERFORMANCE OF INDUSTRIALISATION

Three specific but overlapping issues have dominated debates on industrial performance in the past. The first has already been discussed and concerned the liberal perspective - that industrial performance has been constrained by apartheid. The more recent debates on post-apartheid industrial policy have essentially discarded this issue. A second set of issues weighed up the balance between inward and outward orientation of industry and the selectivity of sub-sectors in industrial strategy. A third issue has been the extent of state- versus market-orientation of the economy.

3.2.1 INWARD VERSUS OUTWARD INDUSTRIAL ORIENTATION

Debates on inward and outward orientation have pivoted around the widely accepted proposition that South Africa followed an import-substituting industrialisation (ISI) path. Observers and policymakers hold that, after exhausting the "easy" industrial activities by the early 1960s, the "growth path" of ISI became progressively difficult in the 1970s and contributed to the crisis and stagnation of the 1980s.[22]

Houghton (1973, p.18) points out that the need to shift away from ISI and to develop an export orientation, was recognised and advocated in a number of successive government reports, beginning with the Third Interim Report of the Industrial and Agricultural Requirements

[22] See, for example, Moll (1991, p.283)

Commission (1941). He identified several of the more common reasons for the failure to diversify out of mining, including the low productivity of production, partly linked to the small domestic market and poor economies of scale and the inward mentality of South African industrialists.

It is generally accepted that South Africa had completed the first stage of industrialisation, domestic production of consumption goods, during the 1950s. As Scheepers (1982, p.20) claims in retrospect:[23]

> The studies of both T.A. du Plessis and the author during the sixties proved that this country entered the second phase of the import-substitution process during the fifties.

For him, this should have led to the increasing domestic production of intermediate and capital goods. It was certainly anticipated to be the prospect at the time and also during the following years. Such was the case for Marais (1960) who recognised, as others have done subsequently, that import-substitution does not necessarily reduce the propensity to import, thereby easing pressure on the balance of payments, since import dependence shifts from consumption goods to their input requirements. Similarly, Lumby (1983, p.227) notes that:

> Although South Africa became nearly self-sufficient in the production of many consumer goods and certain equipment for mining, agriculture, construction and transport, industries which produced consumer goods continued to import a large percentage of their raw material requirements ... The contribution of manufacturing to the Gross Domestic Product may have

[23] Zarenda (1975) quotes from the Scheepers' study to the effect that only 16% of growth was accounted for by import-substitution between 1956/7 and 1963/4, as compared to 52% between 1926/7 and 1956/7. Zarenda suggests that industry (and exports) should be promoted rather than protected, opening the way in principle to a variety of policies and not just price support.

> outstripped the combined contribution of agriculture and mining for the first time in 1965, but that industrial growth which was possible was not self-supporting or independent.

Lachman (1974), also accepting that the early stage of easy import-substitution had been completed, sought greater export orientation and must have been one of the first commentators to suggest South Korea as a potential model of export-orientation from which lessons could be learnt - however correctly that model was understood. For Reynders and van Zyl (1973), there is a recognition that there had been more than enough import policy (especially protection) but an absence of export policy - on the grounds that "gold sells itself". One of these authors, Reynders, had just completed chairing the commission examining export policy.

Some, however, did not agree that inward policies were exhausted but pointed to the issue of the selection of sectors to benefit under import-substitution protection. For Marais (1960, p.67) blanket ISI had run out of steam by 1960 and required targeting:

> It therefore does not seem necessary to protect and stimulate a whole range of industries, but to concentrate on a few industries only, such as, for example, the production of rayon, synthetic rubber, and motor vehicles, parts and accessories.

Bell (1975), in response to the Reynders Report (1972) on the export trade, argued in favour of more import-substitution into intermediate and capital goods in order to accrue dynamic economies rather than seeking larger potential markets, as the report recommended, through blanket exports. But Bell went further, recognising that the international climate had, after the

1973 gold and energy price rise, grown more hostile to developing country exports.

A synthesis of or, more exactly, a compromise between these competing views is to be found in Brand's (1976, p.172) contribution. He argues that proponents of both inward and outward strategies base their respective arguments:

> on the basis of very much the same evidence about the country's past patterns of development, and very similar perceptions of the present structure of its economy.

We will argue below that this basis is falsely conceived. However, Bell also raised the issue of selectivity, that there should not be a general disposition either towards protection for import-substitution or for export promotion, but rather the decision should be based on their potential to fulfill the objectives of economic policy, whether these be employment creation, easing balance of payment constraints, protection of infant industries or short-term considerations such as anti-dumping. Moreover, Bell (1975, p.173) recognised the unscientific basis on which debates had been conducted and selectivity had been exercised in the past, pointing to the lack of "intensive micro-economic study of individual sectors and products" concerned. In Chapter four, we have argued that decisions around selectivity were bound up with the patronage that the state offered to Afrikaner capital during much of the post-war period.

Another objection raised to policies shifting to an export orientation related to the perceived structure of the economy. Ratcliffe (1975, p.80) warned that Reynders had underestimated the extent of internal structural

change that would be required to shift to an export orientation:

> ...the essentially one-sided approach of the Commission to the expansion of exports causes it to underestimate the extent of the internal transformation of the South African economy which is required for exports to lead growth. Again and again the Commission tentatively considers various aspects of the matter, notably in the chapters dealing with production costs, fiscal measures, finance, and transport. Nevertheless it does not fully accept the proposition that domestic economic changes are the essential precondition for increased exports and for sustained growth.

In response, Reynders (1975, p.123) argued that it would be the implementation of export incentives that would lead to the structural changes, not the reverse:

> ...my fundamental hypothesis is that the newly introduced export incentives have in fact introduced a structural change in the whole of South Africa's export environment. However, since this is a very recent change; since the package of incentives is not yet complete; and since the understanding and acceptance of the new package has not yet worked its way through to all exporters and potential exporters, it is rather premature to look for a statistical quantification of the extent of the change which I am hypothesizing.

As discussed in Chapters one and four, the industrial policies that were actually implemented in the decade of the 1970s greatly strengthened the role of the MEC core within South Africa's economic structure. The

results are also evident in figure 1.6. In this sense, Ratcliffe, and many others engaged in this debate, have based their observations on a false perception of the pattern of industrialisation - on backward linkages from consumption goods. Similarly, the political factors that influenced decisions around industrialisation have only been partially appreciated and these go some way towards explaining why effective policies were not taken despite the recognition of the same manufacturing sector weaknesses time and time again in the post-war period. Ratcliffe (1975, p.75):[24]

> Fifteen years ago the report of the Viljoen Commission into the South African commercial policy was criticized for repetitiveness; the inclusion of superfluous details, incoherence, incompleteness and partiality in the presentation of economic arguments; and excessive concern with immediate decisions on the implementation of policy whose general direction had already been determined, instead of a scientific and reasoned analysis of alternative policies. These defects are also to be found in the report of the Reynders Commission.

Clearly, the terrain of debate has focused narrowly on the perceived exhaustion of ISI. It is our contention, however, that as a methodology used to interpret the specific form that industrialisation has taken in South Africa, the ISI concept is far too blunt. First, ISI's presumed path and chronology does not match the pattern of industrialisation in South Africa. Second, the descriptive categories of light (consumer) and heavy (producer) goods, used to sub-divide industries conceal other important sectoral linkages around the mining, mineral processing, chemicals and energy sectors which, in South Africa, have imparted a greater impulse to

[24] The reference is to Samuels (1959) who is less overt in his criticism than is suggested but does raise the issue of how selectivity is to be determined.

industrialisation than has blanket ISI protection. Thirdly, contrary to ISI logic, South African industry has long demonstrated a considerable capability in capital goods manufacture.

3.2.2 IMPORT-SUBSTITUTING INDUSTRIALISATION (ISI) - AN INAPPROPRIATE METHODOLOGY FOR EXPLAINING INDUSTRIALISATION IN SOUTH AFRICA

First then, the empirical evidence reveals flaws in the presumed path and chronology of ISI in South Africa. Figure 5.1 shows that, even at the most aggregated level, "import-substitution" had largely taken place before 1945. After this until 1970, imports ran at about 40% of gross manufacturing output falling to 30% thereafter.

Important sub-sectoral trends are revealed in figures 5.2a and 5.2b which show the real division between light (mainly consumer goods) and heavy (mainly intermediate goods, industrial consumables and producer durables) manufacturing activities. From 1932, heavy activity output grew at a faster rate and caught up with consumer good production by the end of WWII.

Thus, the idea that imports of "easy" consumer goods were substituted for first and that this "stage" was exhausted by the 1960s is inaccurate.[25] Figure 5.3 reveals that the ratio of imports to value added for "easy" consumer good sectors fell from 270% in 1924 to 75% in 1945 while the "difficult", capital-intensive sectors (mostly associated with the MEC) fell from 335% to 50% over the same period. While a greater proportion of consumer goods were wholly manufactured domestically, considerable in-roads into local manufacture of difficult, capital-intensive goods were also being made. Data are not available for the period between 1958 and 1970, but figure 5.3 shows that only a slight decrease in import/value added ratio for both "easy" and "hard" sectors was achieved.

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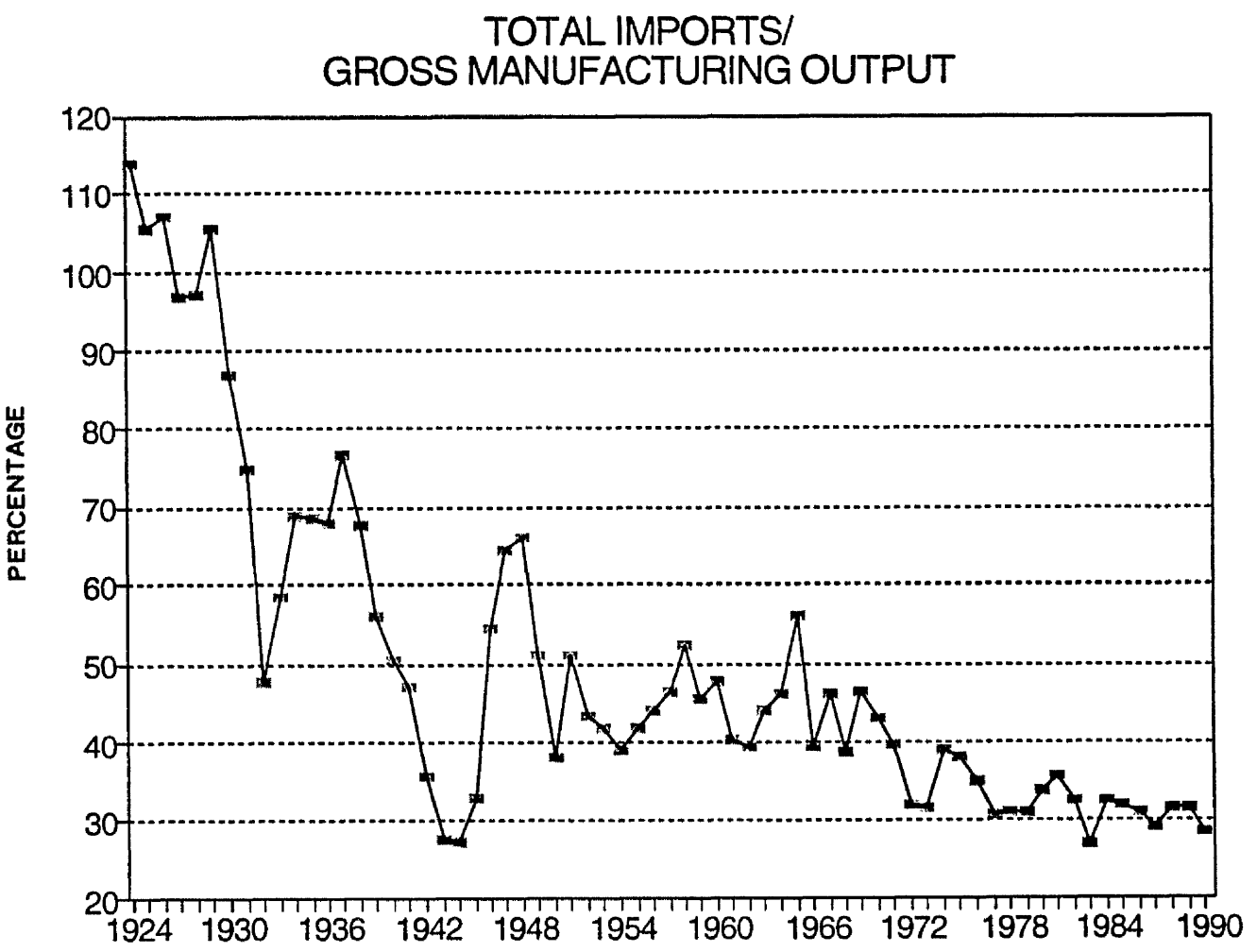
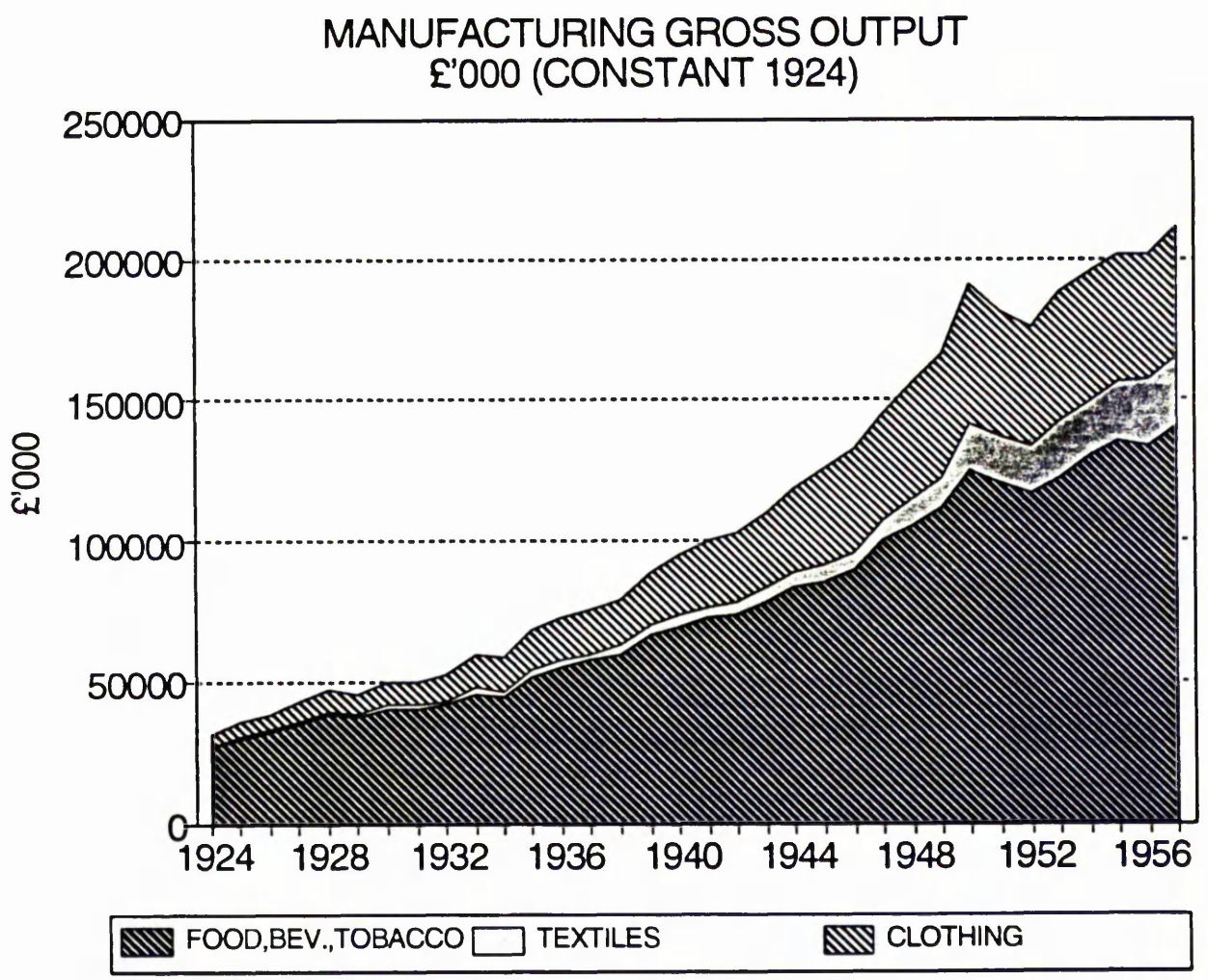
[25] This sequencing was suggested for developing countries by Little, Scitovsky and Scott (1970).

FIGURE 5.1 - TOTAL IMPORTS AS % OF GROSS MANUFACTURING OUTPUT



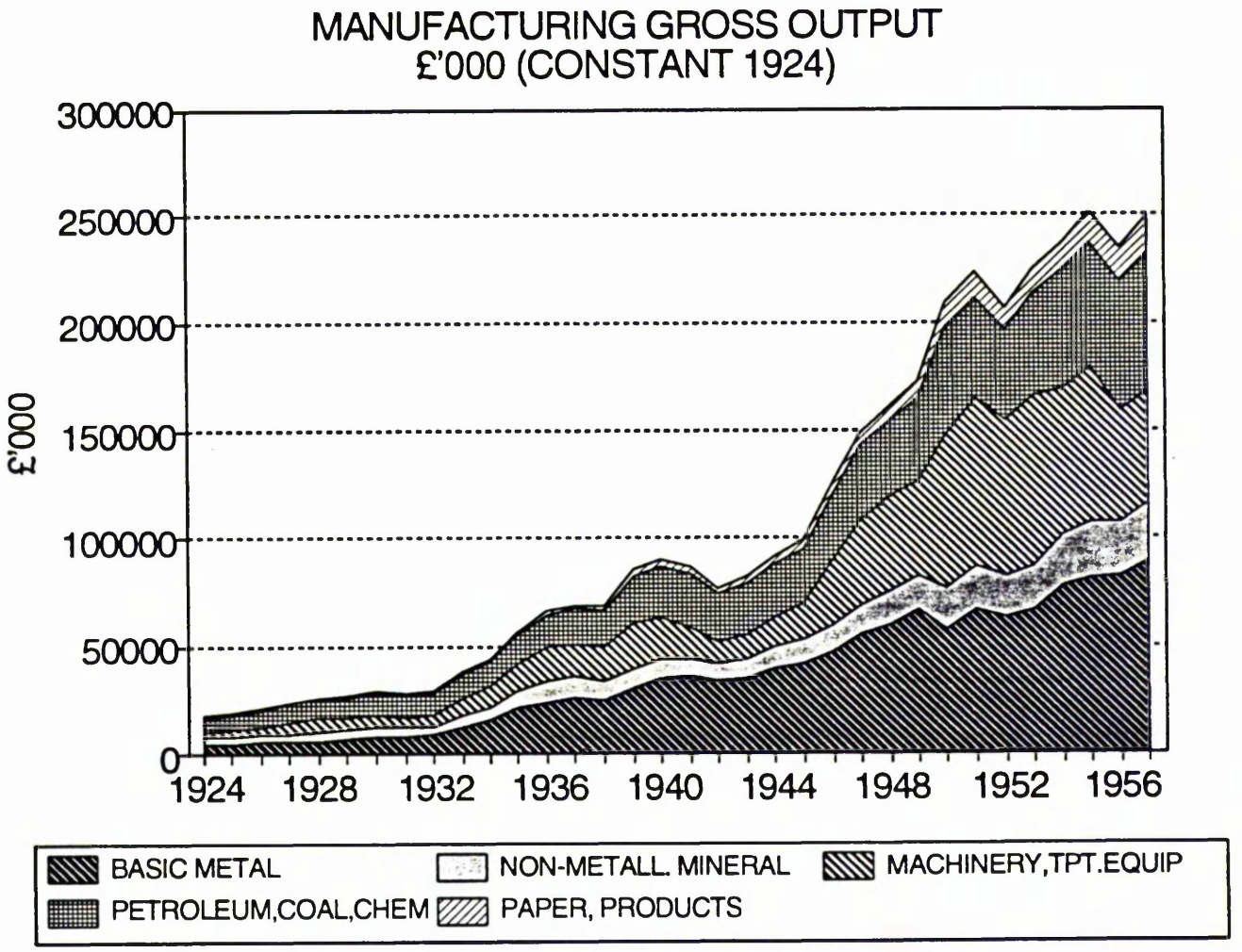
Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

FIGURE 5.2a - GROSS MANUFACTURING OUTPUT BY SECTOR



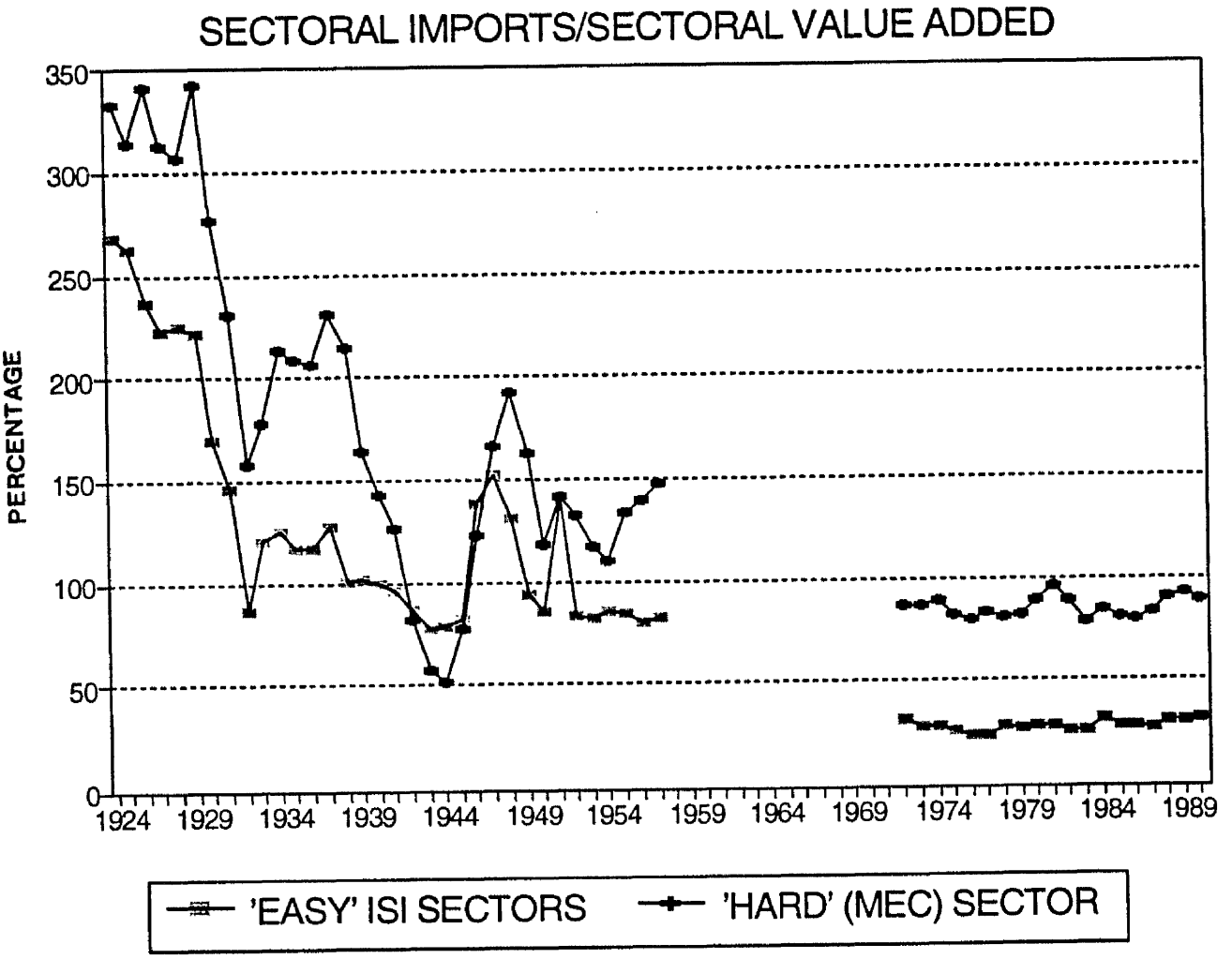
Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

FIGURE 5.2b - GROSS MANUFACTURING OUTPUT BY SECTOR



Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

FIGURE 5.3 - SECTORAL IMPORTS AS % SECTORAL VALUE ADDED



Source: Union Statistics for Fifty Years (1960), South African Statistics (1990), IDC (1992).

"Easy" ISI sectors include : Food, Beverages, Tobacco, Textiles, Clothing, Leather and Rubber Products.

"Difficult" ISI sectors include : Basic Metal Industries, Chemicals, Fabricated Metal Products, Non-Electrical Machinery, Electrical Machinery, Paper and Publishing.

This is not to deny that imports declined with the flourishing of local production behind tariff barriers. However, the pattern of industrialisation in South Africa cannot be reduced to an ISI model which, in any case, grew out of studies based on patterns of Latin American industrialisation,[26] and interpreting industrialisation in South Africa as ISI is misleading for two reasons.

First, by aggregating specific sectors, the dynamic potential of linkages between economic activities are not recognised. ISI analysis has been based on a conceptual divide between industries which manufacture consumer and producer goods. Other linkages within the economy, for example between mining and manufacturing or between manufacturing sub-sectors, have usually been ignored. Yet, linkages around a Minerals-Energy Complex were emerging even as early as the turn of the century when the largest dynamite factory in the world was constructed at Modderfontein and was subsequently to impart a propulsive effect on the chemicals sector. The impact of the primary steel industry which began production in 1933 is clearly evident in figure 5.2b and led to industrialisation across a wide range of sectors.

Secondly, ISI analysis has tended to reduce the political factors that have influenced the pattern of industrialisation to the strength and ability of indigenous capital to impose protection. But, for South Africa, inter-war diversification in industrialisation was constrained by the disjuncture between the political and economic power of Afrikaner as opposed to mining capital. So, the heavy capital-intensive industries were developed early on relative to the pattern for conventional ISI, reflecting an uneasy compromise between serving the MEC and promoting national capital.

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26 The origins of these concepts are usually attributed to the work of the Economic Commission for Latin America (ECLA) in the 1950s and 1960s.

The creation of Iscor is a case in point. The development of the steel industry went some way in stimulating other sectors but industrial policies could not be cohesive enough to carry industrialisation extensively downstream, out of the MEC core, in Chapter 3. In Korea, by way of contrast, heavy capital-intensive industries have been fostered within a more clearly defined industrial strategy that could be carried through by the state, because political and social factors did not pose a disjuncture and an obstacle to state planning and coordination.[27]

[27] See Fine (1992) among others for a discussion of this.

3.2.3 STATE VERSUS MARKET IN INDUSTRIAL PERFORMANCE

The debate over state versus market has been and continues to be largely sterile, of limited scope and based on a false conception of the realities of state-capital relations in South African industrial development.[28] In more recent debates, attacks on any active role for the state has become a component of a range of contemporary policy studies (see below).

Two issues have dominated the debate on the role of the state in industrial performance. The first has already been discussed above, being the liberal assault on state intervention in labour markets which is held to have impeded industrial performance, Moll (1990). The second has been around the creation of state-owned industries. The use of this policy instrument has often been counterposed by positions which place greater reliance upon static comparative advantages in mineral exports.

Others, such as Black and Stanwix (1987) have seen state corporations in a broader economic context. They recognise that state-created industries were among a number of factors which historically drove industrialisation. Others included tariff protection, state repression of labour, the demand from mining activities, diversification using mining surpluses and South Africa's relatively open economy stimulated from time-to-time by events in the rest of the world. The pattern of industrialisation that resulted from these factors is seen as having led to structural constraints to growth which emerged in the 1980s. These included: inadequate demand from a limited domestic market; exhaustion of easy consumer good import-substitution at the cost of raising capital good import dependency; an

[28] These are fully discussed in Chapter four but, essentially, economic and productive linkages and the degree of interpenetration of state and private capital have, in most cases, not been recognised.

anti-export bias through overvalued exchange rates; uncompetitive industries featherbedded by protection; the promotion of capital-intensive investment; the concentration of ownership, coupled with capital strike and flight.

However, such a perspective tends to overlook the more obvious political and economic linkages forged by state-owned industries. The actual process of industrialisation in South Africa involved a symbiotic relationship between the state corporations and private capital around the MEC. Central to the process of post-war industrialisation has been the erosion of the disjuncture between English capital's economic power and Afrikaner capital's political power. The creation of state-owned corporations should be viewed in the context of this process which involved the creation of large-scale Afrikaner capital around the MEC core, its interpenetration with English capital and, ultimately, their combined collaboration and coordination through the state. The first phase, centred in the 1950s, witnessed the state's successful encouragement of the development of large-scale Afrikaner capital. The second phase around the 1960s witnessed the interpenetration of large-scale Afrikaner capital into mining, with the active collaboration of both the state and mining capital itself. As a result, by the 1970s, there was no longer a political obstacle within the capitalist class to the adoption of a concerted economic strategy on the part of the state, Chapter four.

Indeed, one was adopted. But economic conditions had changed, both through the collapse of the Bretton Woods system, and the associated rise in the price of gold, and through the oil shock which similarly enhanced all energy prices. Consequently, the state and private capital drew upon policies to strengthen the MEC in its core activities. Thus, the third phase, emerging in the 1970s,

consolidated the collaboration between MEC capital and the state with extensive, if not comprehensive, polices for the economy emerging for the first time in South Africa's history. They were directed at the MEC, through the expansion of public and private investment to promote mineral, heavy chemical and energy production, both for domestic and foreign markets. In addition, a highly coordinated strategy to produce armaments was also implemented. By the 1980s, even as the boost to core MEC activities was eroded, the apartheid system as a whole was in crisis. With increasing sanctions, disinvestment and labour and social unrest, it is hardly surprising that a coherent more widely-based industrial strategy continued to remain off the agenda. These adverse conditions might be considered sufficient reason but they were reinforced by the mode of operation of the economy, particularly of its previously developed financial system. For this had been more geared to speculation and acquisition than to long-term provision of investment finance to industry. And the policy priority of the financial system has been oriented around macroeconomic objectives rather than those of industrial development as in the disastrous liberalisation of the financial system in the early 1980s. This is dealt with in the next section.

3.2.4 INDUSTRIAL FINANCING AND INDUSTRIAL PERFORMANCE

Industrial performance has also been associated with developments in the financial sector, and debates on the impact of industrial finance on industrial performance have been dominated by the conventional market-based neo-classical perspective which holds that industrial development proceeds smoothly along a well-worn path, lubricated:

> ...institutions canalizing savings - including mutual funds - and the functions of the new issues market ... together with the position of the stock exchange as the facilitating mechanism through which the burden of waiting and risk bearing was shifted to those most able to bear it, and which facilitated the transfer of capital from those who possessed it to those who could employ it more profitably. Dickman (1973, p.373)

The absence of capital markets is held to have resulted in (relatively) labour-intensive industrialisation. Until WWII, Norval (1962, p.97) argued that industrialisation was constrained because industries had:

> ...to rely on what they could scrape together themselves or obtain from friends, legal firms, boards of executors and trust companies, one of whose main functions was to administer estates of deceased persons and invest the savings of their clientele.

For Norval (1962), the inter-war period was marked by the development of labour-intensive industries like clothing, tanning (coarse leather not requiring capital equipment), canning, confectionery, cigarettes using primitive machines, foundries and engineering repair

shops. From our perspective, this is misleading for a significant proportion of labour-intensive industrial activity resulted from capital-intensive investment in the steel industry, through the creation of state-owned Iscor and an ensuing range of downstream joint venture metal industries with private capital, Chapter 3.

Martial control of production during WWII interrupted the "normal" process of industrialisation, according to conventional thinking, and state intervention spurred industrialisation for war production. For Norval (1962, p.53), WWII and not 1925-39 was the turning point. "The country went from a labour-intensive to a capital-intensive basis of its manufacturing industries." This occurrence was attributed equally to a speculative bubble in industrial financing, Norval (1962, p.53):

> No efforts were spared, nor funds for the equipment of industries. In many cases it could be no more than improvising. The remarkable phenomenon was that there was no lack of capital. Capital was forthcoming like rabbits from a hat. With the most favourable prospects of profits and dividends the general public had no hesitation in placing their savings at the disposal of industry by taking up shares based on nothing more than the optimistic assurances of industrialists of whose credentials very little was known and still less regarding the basis of the security offered. It was a real bubble and many came out the poorer, but the wiser, from these speculations.

Dickman (1973, p.373) also refers to constrained industrialisation in the 1950s due to the fact that:

> ...disillusionment with the stock exchange was rife following the 1948 debacle on the share market, when

> the hesitation that was to continue characterizing the investment scene for many years to come had as its counterpart the fact that the capital market mechanism remained relatively dormant and underdeveloped, and profit re-investment continued to be a major source of industrial finance.

In contrast to the financial constraints to industrialisation that typified the 1950s, the boom in aggregate manufacturing sector activity in the 1960s is attributed to the freeing up of impediments in financial markets. For Viljoen (1983, p.50):

> A large number of new financial institutions have appeared on the scene, such as merchant banks, general banks and investment houses, and, in the late 'fifties, an increased interest began to be displayed by pension funds and insurance companies in investment in industrial equities. This was a major element in permitting the market to fulfil its role of efficiently transforming the savings of the community into capital formation. The result has been the broadening of share ownership and marketability, and the increased ability of companies to look to the market for their capital needs.

Yet, despite these conducive institutional conditions, even Dickman (1973, p.375) acknowledged that finance did not flow as smoothly into expanding manufacturing activity in the 1960s. Long-term insurers, pension and provident funds almost doubled the proportion of assets invested in equity between 1961 and 1965, yet:

> Just how much of the new capital that flowed from the public and the institutions in the two major new issue booms of 1963/65 (when a net R371 million was raised from the public) and 1968/9 (when a net R719

> million was raised) was destined actually to finance new fixed investment or fund existing borrowings is another matter ... And even if, as it will be argued, the majority of issues was designed either to attract savings for further but diversified investment in existing securities (as in the case of investment trusts) or to enable local entrepreneurs or foreign investors to reap the benefit for a successful profit record in their personal or foreign corporate capacity and yet retain effective control (as in the case of offers for sale, techniques similar to this but classed as new issues, and pyramid companies), one should not complain.

Dickman thus draws attention to the simultaneous emergence of the speculative nature of financial markets in South Africa and their overlapping with growing ownership concentration, facilitated by the very financial institutions whose purpose, according to theory, was to mobilise and allocate savings according to market-determined investment needs.

His failure to connect the two occurrences is partly noted by Viljoen for, while developed financial markets supposedly enhanced industrial performance during the 1960s, it apparently also contributed to growing market defects, particularly through rising ownership concentration. Viljoen (1983, p.51), in noting the spate of mergers and acquisitions in the 1970s, suggests that the latter partly contributed to subsequent poor manufacturing performance:

> The Commission of Inquiry into the Regulation of Monopolistic Conditions Act found that according to the 1971-72 census ... that virtually every industry investigated by it could be considered as either monopolistic, duopolistic or oligopolistic in

> structure ... The measure of concentration in South African industry naturally raises serious issues in regard to the maintenance of competition and, ultimately, of the free enterprise economy.

More recently, see below, neo-liberal positions have extended this to argue that economic stagnation was caused, firstly, by the concentration of state, rather than private, ownership in the productive sector which prevented the financial sector from efficiently deploying resources and, secondly, that the financial sector itself was constrained by a variety of regulations, such as foreign exchange control and prescribed assets.

A number of positions rooted in neo-classical theory, have drawn different conclusions from rising ownership concentration and evolving financial markets. According to the theory of monopoly capital, Innes (1983), industrial financing did receive a boost in the late 1950s as mining houses redirected profits from mining into manufacturing through new financial institutions, but this was seen as a consequence of the attainment of the stage of finance capital. However, it is not clear why either the achievement of monopoly capital or the emergence of capital markets did not lead to a dynamic and self-sustaining manufacturing sector after the 1960s.

Black and Stanwix (1987, p.52) on the other hand, view the rising concentration as an "organic" response of capital:

> The mergers and takeovers which were the hallmark of the process of centralisation of capital during the 1970s were spurred by recession as financially strong groups sought to expand their market share by buying companies weakened by adverse economic circumstances.

A curious feature of debates on industrial finance is the way state and private sector finance and investment have been compartmentalised. Although many acknowledge the existence of the IDC in providing finance for industry, its activities are hardly referred to by Dickman (1973), for example, even though its investments while sectorally focused within the MEC core, constituted more than 50% of manufacturing sector fixed investment. Instead, the financing of state-sector industries have often been portrayed as the creation of monopolies, rather than as sectors with extensive upstream and downstream linkages with the private sector, imparting a propulsive effect on a broader industrial trajectory.[29] For Viljoen (1983, p.51):

> ... the state has played an important role in further enhancing the already undue measure of concentration. This has been effected through the Public Corporations and certain State departments, which dominate or monopolize the basic iron and steel and chemical industries, the supply of electricity, and the provision of rail, air and postal services.

Others, for example Levy (1981), cited in Black and Stanwix (1987), view state-owned industries as "capital-intensive" as opposed to private sector investment which, presumably because they were more responsive to factor markets, have been more "labour-intensive". More recently (see below), debates on the impact of industrial financing on industrial performance have focused on the reasons for the capital-intensive nature of South African manufacturing industry, with the neo-liberal position being that capital-intensity is the result of state "interference".

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[29] Significantly, against all its previous recent credo, even the World Bank has recognised the role of crowding-in of the private sector by public sector investment in the South African context.

From our perspective, the issues around financing and industrial performance have been discussed using too narrow a conception of the financial and manufacturing sectors. Firstly, industrial performance cannot be explained solely by the extent of financial market development since considerable industrialisation took place before these emerged in their present form and, furthermore, financial market liberalisation in the 1980s did not enhance industrial performance.

Secondly, it is our contention that past and present debates have been based on a false conceptual division between mining and manufacturing. The bulk of industrial finance in the 1950s, 1960s, 1970s and late 1980s, has been concentrated in the core sectors of the MEC and continues to be so into the 1990s, (figure 4.3). Thirdly, the debates on industrial finance have largely ignored the role of state corporations and their symbiotic relationship with private capital in industrialisation, and simultaneously, have not recognised the resonance between the pattern of industrialisation and its financing and the evolving and peculiar form of conglomerate ownership which incorporates the financial sector.

In terms of the MEC, the growing power of large-scale capital has taken place in the context of the erosion of the disjuncture between English and Afrikaner capital from the inter-war period. The particular conglomerate form that has evolved in the post-war period, enveloping the financial sector in the process, is to be seen as a whole, rather than as separate and distorted "markets".

3.3 CONTEMPORARY DEBATES ON INDUSTRIALISATION

Recently, a more sophisticated understanding of the workings of the economy has emerged, focusing especially on the poor performance of the manufacturing sector, Lall (1993), Fallon et al (1993), Kaplinsky (1992) and Levy (1992). Whilst manufacturing is perceived to have been successful in the narrow sense of having increased its share of the economy at the expense of mining and agriculture, its overall performance over the past two decades is considered inadequate by a number of criteria, including many of those identified in past debates such as low productivity and ISI limitations.[30]

The consequences of adopting this false conceptual divide between mining and manufacturing has already been demonstrated, and it applies equally to agriculture, although in practice, linkages between agriculture and manufacturing are not as strong as those of core MEC activities. Apart from this, these analyses also adopt ahistorical approaches, ignoring the roles of the financial sector and the evolving corporate form in shaping and reproducing the pattern of industrialisation.

An example of the former is Fallon et al (1993), who argue that, had the state not intervened in creating and financing steel, chemical and mineral processing industries, scarce capital resources might have better been utilised to other purposes, for example, to create more jobs, export-oriented industries, etc, many of which would have realised greater returns to capital employed. Such an appraisal is reminiscent of Moll's ceteris paribus arguments discussed above. Levy (1992) implicitly accepts this, attributing heavy investment in steel, chemical and related industries to policies of state

[30] Indeed, memories, and scholarship, seem to be short with the unacknowledged rediscovery of economic deficiencies (and remedying policies) that had already been identified in the past.

intervention which resulted in a manufacturing sector suffering "distortion" from some ideal "norm".

In addition, Levy (1992) notes that, whilst investment in the Sasol process might not be economically and financially justified ex ante, once undertaken it may, ex post, support a market-driven rolling programme of high capital investments in downstream activities such as plastics, particularly since ownership has largely passed into private hands. In fact, chemical sector investments have not proceeded downstream but have remained locked into the capital and energy-intensive MEC.

From our perspective, Levy self-admittedly fails to explain why investments have taken the direction that they have, and understands industrial policy on too limited a canvas,[31] and forcibly disconnects manufacturing from the MEC as if, for example, the fortunes of the textile and clothing sectors have more in common with chemicals and steel than the latter do with mining and energy. His assessment of the past and of future prospects relies more or less completely on a theory of comparative advantage derived from (labour-intensive) factor endowments.

Kaplinsky (1992) and Lall (1993), however, while noting the distortion, do not argue, as the others seem to do, that state intervention is inherently and normally misplaced. Instead it is argued that selectivity of state-led investment in South Africa's case was misplaced. Although such judgements are made on economic bases, there is an absence of consideration of the political contexts in which the investments were made.

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[31] By way of digression, note that he also observes that "a producer that currently supplies one-third of local refrigerators estimated that production could be doubled with the addition of no more than 400 workers", p.8 - suggesting a considerable degree of excess capacity for this durable at least.

Whilst many consider the creation of state corporations in South Africa to have been ill-judged and the consequence either of (unexplained) policy mistakes or of commitment to self-reliance in the face of potential sanctions, it is important to recognise that, the direction and content of such policies are thereby not predetermined. They reflect continuing capabilities and the response to economic and political interests as well as becoming institutionalised in particular ways.[32] Our approach suggests that these observations have to be situated in relation to the MEC.

The apparent consensus of contemporary debates on the triumph of outward over inward oriented policies in the late 1980s is premature and also a repetition of a debate which has been conducted on very narrow terrain for much of this century between the interventionist and more liberal factions of orthodox theory. Levy (1992, p.17) reports from the IDC that seven investigations into trade by government committees between 1958 and 1988 drew the conclusion that greater emphasis had to be given to exports at the expense of inward orientation by shifting the balance of incentives. Previously, it was demonstrated that the concept of ISI was inadequate to explain the pattern of industrialisation. Similarly, the supposed shift to an export orientation is inadequate as a methodology to understand the recent process of industrialisation in South Africa.

Firstly, export orientation has not shifted industrialisation away from the MEC. Most new manufacturing sector investment is taking place in large-scale mega-projects within the established MEC core, which, as a whole, has historically been export oriented.

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[32] See, for example, the discussion of South African nuclear power in Christianson (1990). He argues that whatever its rationale within South Africa, it is necessarily associated with an undemocratic and informationally closed process of decisionmaking, one which we would argue is open to manipulation by entrenched interests, most obviously the military but also the associated manufacturers. For a similar view of the British nuclear industry, see Fine and Harris (1985).

The MEC then is the subject of considerable intervention from the present government through tax (37E) subsidies and guarantees from potential future governing parties. Export incentives (GEIS) provide additional profits and guarantees to the close-knit conglomerates that are involved in such cast-iron investments. As Trade Monitor (1993, p.6) observes:

> GEIS provides a premium to companies that would have exported in any case. It is a bonus hand-out to large companies such as Iscor, Sappi, Mondi, Armscor, Sentrachem and AECI. Correspondingly, very little effective encouragement is given to potential first-time exporters in order to entice them into producing for the export market.

GEIS alone has had little impact in shifting export dependence away from the MEC, and its impact in future will be undermined when the heavy investments under 37E incentives begin production. Table 5.2 indicates a dramatic fall in primary exports, mainly gold. This has partly raised the relative percentage of non-primary exports. In addition some of the real rise in exports of Stage 4 Manufactured Products is unsustainable. A considerable proportion of 1990 and 1991 exports consisted of one-off exports from dying shipbuilding and railway equipment industries and from the armament industry. In the latter case, the product concerned is an artillery system that achieved an internationally competitive edge because it could be developed and tested in the Angolan war by the Defence Force. In the absence of continuing regional conflict in which similar systems can be developed and improved, it is unlikely that arms exports can be sustained.[33]

[33] See Rustomjee (1993) for a more comprehensive account of the armament industries.

TABLE 5.2 - RECENT EXPORT TRENDS, % OF TOTAL INDUSTRIAL EXPORTS

	1988	1989	1990	1991
Primary Products	76.7	74.7	71.8	67.9
Beneficiated Products	8.7	9.6	9.2	11.0
Material-intensive Prods.	10.4	10.7	12.5	13.1
Manufactured Products	4.1	5.0	6.5	8.0

Source: Trade Monitor (1993).

Secondly, those looking to export orientation as the stimulus to renewed industrialisation have not noticed that industrial policy, other than for MEC sectors, has been increasingly divorced from the main policy making institutions like the IDC. In the past, non-MEC industry was in part promoted by the now defunct Board of Trade and Industry (BTI), which administered uncoordinated tariff policies.[34] Today, these sectors seem to have been abandoned to negotiate their respective fates in various negotiating "forums" involving labour, capital and the state, while the latter unilaterally reduces tariffs. There is, in effect, no industrial policy for them.

These assertions are supported by the inadequacy of policy management, even at the level of basic industry monitoring. In its investigation into the level and structure of export development assistance for industry, the BTI (1988, p.44) stated that:

> the nature of the present system of export assistance is such that sufficient information to monitor the effectiveness and efficiency of the system adequately is not forthcoming.

[34] After a battle for institutional supremacy between the IDC and the BTI, the latter was abolished in 1992. Whilst the conventional wisdom is that increased trade liberalisation has been a response to external pressure and fashions, we would emphasise the weakening representation of non-MEC manufacturing interests.

Since the policy making role of the BTI has now been downgraded, it is difficult to imagine any improvement in this sorry state of affairs.

To conclude, perceptions of industrial performance have ranged across ideological divides, have often been based on a narrow range of factors and have usually utilsed highly aggregated analytical categories. Most importantly, though, they have failed to provide an adequate explanation of the pattern of post-war industrialisation. As argued above, within the South African economy, there lies a Minerals-Energy Complex core. Only by unravelling its mode of operation and its intimate relations to the state and finance is it possible to address the issue of the nature of the weakness of manufacturing, which other analyses take as their unproblematic starting point.

The presence of a Minerals-Energy Complex core and its operation as a system of accumulation has been outlined in previous chapters. In terms of the conduct of industrial policy then, three industrial policy instruments were used in the post-war period. The first instrument, of creating state corporations and joint ventures with private capital, provided a major impetus to targeted core MEC sectors, thereby shifting the trajectory of the economy by the sheer weight of investment involved. The second instrument of tariffs was unfocused, reactive to various fractions of capital and poorly monitored and managed. There were no clear criterion for selectivity on the basis of forging complementary backward or forward linkages with the MEC core, so tariff policy was uncoordinated with the first instrument, often subordinated to protecting the balance of payments. Neither of these instruments was accompanied by additional supportive policies to overcome specific problems, such as skills constraints, technology access and appropriate research, identified by various official investigations throughout the post-war period. The third instrument, decentralisation, has not been dealt with in detail here. It was poorly funded, uncoordinated with other instruments and doomed to failure given poor infrastructure and corresponding poor performance in the traditional centres of industry. Moreover, it was subordinated to the political imperatives of apartheid, rather than being part of a cohesive national industrial strategy which, in any case, did not exist.

Compared to the pro-active thrust of IDC-led industrialisation initiatives around the MEC, the impact of the BTI-controlled tariff policy has been relatively ineffective in altering the pattern of industrial development in South Africa since the inter-war period. Its recent demise fully reflects the ascendance of large-

scale capital finding resonance with the state institution, the IDC, which historically supported that climb. Present industrial policy, although seemingly oblivious of the existence of the MEC, is more supportive of the MEC core sectors than ever. Any selectivity in industrial policy, other than on the grounds of comparative advantage, is being firmly subordinated to balance of payment, fiscal and monetary policy imperatives.

From our perspective, this can only result in the widening of the cleavage between the MEC core and the rest of manufacturing industry and, unless addressed in the near future, can only lead to the de-industrialisation of South Africa and the erosion of the capacity of industry, in its widest sense, to reduce its dependence on the MEC core. Moreover, those proposals with a genuine commitment to the use of more wide-ranging instruments to achieve a more wide-ranging outcome across manufacturing are doomed to failure unless they acknowledge the history and continuing dynamic of industrialisation and the overwhelming economic and political role that has been assumed by the MEC as the foremost axis of capital accumulation.

Our discussion has drawn predominantly upon empirical evidence and the arguments to be found in government reports. The latter, however, has also been accompanied by a parallel academic literature dealing with South Africa's industrialisation.

While periodisation of ideas is difficult, given their resurgence from time to time as well as the fundamental differences in economic paradigms, it is a useful starting point. By the 1970s, Rostowian determinism and optimism prevalent within liberal thinking was challenged by the, perhaps equally deterministic, Marxist-Revisionist school. The perceived

cul-de-sac that industrialisation took was almost universally accepted and termed "import-substituting industrialisation" (ISI). Much of this work lacked empirical detail. However, other work during the mid-1970s, in particular that carried out within a Schumpetarian paradigm around capital goods and more complex manufacturing processes went beyond simple aggregates. In the 1970s also, another intellectual path within the Monopoly Capital school focused on the impact of concentrated ownership and power on industrialisation.

Most of these debates occurred before declining growth in the 1980s took on a pronounced structural, rather than an apparently cyclical character. Subsequent attempts to explain this have bifurcated between the resurgence of the neo-liberal paradigm, on the one hand, and a variety of more sophisticated and radical analyses, on the other.

Despite the literature's differences with, and putative critique of, the official posturing, the two share many themes in common. Firstly, both of these suffer equally from a distorted understanding of what industrialisation has occurred and why. They view South African manufacturing in terms of a pattern of more or less successful ISI and the need for it to give way at some point, whether past, present of future, to greater export orientation. It is reckoned that ISI proceeds from protected consumer goods to international competitiveness and backward linkages. From our perspective, this removes analysis away from the realities of the South African economy. It has grown on the basis of MEC industries that have failed to create forward linkages rather than on the basis of protected consumer goods.

In terms of the MEC, as a system of accumulation, the continuing gap in domestic capability - filled by imports - between the exports of primary products and the

domestic manufacture of consumption goods has, firstly, been falsely conceived and, secondly, is to be explained by the failure to develop an industrial strategy to carry production through from one stage to the next, to accrue economies of scale, diversification and scope rather than to subordinate industrial strategy and policy to other objectives and to render it subject to piecemeal interventions. The argument is not that South Africa could or should have produced everything from primary products through to final consumption goods, but that such vertical integration out of the MEC was scarcely adopted on a selective basis, with positive consequences for forward linkages and horizontal spin-offs.

Moreover, the discussion of industrialisation on such false premises has been reinforced by the failure to acknowledge the central role of the MEC. In place of focus upon its shifting influence, the academic debate and historiography of industrial development in South Africa has drawn its momentum from theories of industrialisation and development, in general. But the application of many of the latest intellectual fashions from abroad has proved unsustainable, for most of these approaches have adopted a narrow view of "manufacturing industry", divorcing it from other economic sectors. Often, a very high degree of aggregation has been used which has concealed, for example, the existence and role of the MEC core.

Some approaches that have disaggregated by sector have uncritically used methodologies of imported theories. For example, the commonly held assumption, that a Latin American type ISI path was followed in South Africa, conceals more than it reveals. Similarly, recent analyses, preoccupied with the perceived shift from an inward to an outward, export oriented focus, have overlooked the fact that such policies are currently incoherent, poorly monitored, and that the main

beneficiaries are, in fact, MEC industries, which were nurtured in previous decades.

Overlooked too has been the lack of cohesion between the three main policy instruments used to shape industrialisation, namely creating and supporting state corporations, trade or tariff policy and industrial decentralisation. Much of the historiography has focused on individual policy components, or on the (false) dichotomy between mining and manufacturing, but never have the components been considered together in the context of the MEC.

Such considerations are not purely of academic interest, designed merely to offer a historical account of how large-scale capital and the state ultimately collaborated with one another. For, the process by which this became possible, the peculiar creation and incorporation of Afrikaner capital, has profoundly affected the economic policies and outcomes realised over the post-war period. In particular, it led to a neglect of industrial policy, reinforcing the weaknesses of the inter-war period, and has left the economy particularly exposed in the 1980s once the gold/energy price boom had more than run its course, quite apart from the political crisis of the apartheid system itself.

As an interpretation of the thirties and the present, and the passage between them, this thesis is ambitious in drawing upon existing scholarship and insights whilst reformulating them in the light of the central place occupied by the MEC. It (im)poses a historiography in which economic and political developments need to be situated relative to the central themes that have been suggested - even where there may not be a direct connection with the MEC. Even in considering non-MEC sectors, such as agriculture or clothing, the policies adopted towards them and their

apparent separation from the MEC will have been influenced by the latter's dynamic. For the MEC has been the main determinant of the power of agencies within the economy and, consequently, of the economic linkages that are or are not forged.

On the other hand, the extent to which these hypotheses can be justified is severely confined by the limited research available upon which to draw so that the issues addressed have been selective rather than comprehensive. There is much more to be done, on labour markets for example, and the political processes involved more generally. Nor can it be presumed that the historical development of these broadly defined changes has been even across the economy - for, as shown for the inter-war period (if not earlier) as their uneven starting point, they have been subject to various balances and structures of economic and political forces. We hope, however, to have made a start in unravelling the processes and determinants that future research might follow.

CHAPTER SIX

THE MINERALS-ENERGY COMPLEX AND THE ENGINEERING INDUSTRY IN SOUTH AFRICA

INTRODUCTION - THE EVOLUTION OF THE MINERALS-ENERGY COMPLEX

The existence of integral linkages between mining and certain manufacturing sectors has been outlined in Chapter one, revealing a Minerals-Energy Complex (MEC) whose core sectors consist of the mining and electricity sectors as well as a number of key sub-sectors of manufacturing, including iron and steel, chemicals, non-ferrous metal and non-metallic mineral products. The presence of this complex has been overlooked, and the degree of South Africa's industrialisation exaggerated, by the way in which industrial statistics have been constructed. The extent of industrial development has essentially been exaggerated since, in 1989, about 37% of activities within manufacturing were merely immediate downstream activities of the mining and energy sectors, as in metal-processing for example.[1] The role of the MEC is thus shown to be far more important economically than usually acknowledged, particularly when its contribution to exports, imports and employment are taken into account. It encompasses a number of core economic sectors which continue to impart a determining influence on the pattern of industrialisation and economic performance.

The MEC, while central to the economy, has supported a range of upstream and downstream industries. Of these, the engineering industries have had the closest and longest historical links with the MEC, providing it with intermediate inputs and absorbing significant proportions of its outputs. Consequently, the failure of numerous past efforts to diversify out of the MEC is best

[1] Based on 1989 value added, Chapter 1.

understood by an examination of the development of the South African engineering industry. This paper explores this relationship between the MEC and the engineering sub-sectors of manufacturing, which produce what are usually termed "capital goods". Some empirical relationships are established between the expansion of MEC core sectors and engineering industries. These are traced historically, beginning with the inter-war period. Growth and decline in the engineering sectors are shown to have corresponded with fluctuations in MEC investment patterns.

At the aggregate level, engineering industries and capital goods have never acquired a dynamic that has been independent of the MEC. Although a handful of industries at sub-sectoral level have managed to forge independent paths, as evidenced by their export success, these should be regarded, firstly, as exceptions to the rule and, secondly, as indications of the latent potential of South African engineering which has never been cohesively supported by past industrial policies.

Yet, rather than a set of economic sub-sectors with input-output linkages, it is important to interpret the MEC as a system of accumulation, one that has varied in its nature over time. Its development has been mediated by relationships between English and Afrikaner fractions of capital through the state, giving rise to a conglomerate form of private and public corporate structure, straddling the mining, manufacturing, energy and financial sectors. [2]

In Section one, it is argued that, in the inter-war period, the central impediment to diversification out of the MEC core and into engineering activities lay in the historical disjuncture between economic power wielded by

[2] The MEC's historical origins, through the inter-war and post-war periods are respectively traced in Chapters 3 and 4.

English capital and the political power of Afrikaner capital, Chapter 3. Industrialisation was largely confined to the MEC and failed to penetrate further. Industrial policy consisted of protection, other forms of subsidy and the creation of a state sector around steel production, rather than being linked to a strategy of diversification out of the mining base.

The impact of the disjuncture sector-by-sector and policy-by-policy was diverse, depending upon the balance and structure of economic and political forces, since the state depended upon the sources of revenue that could be generated by the MEC. However, a crucial consequence of the disjuncture between economic and political power was to preclude a strategy for industrialisation based on diversification out of the economic strengths (technical, financial, managerial and economies of scale and scope) to be found in mining. Mining capital itself was short of a guarantee that collaboration with the state would not lead eventually to policy penalties from a hostile government. Government could not secure its re-election if revealed to be pursuing policies overtly collaborative and supportive of mining capital. Thus, private capital was insufficiently secure politically to eschew a strategy of importing inputs and exporting profits. Nor could the state appropriate sufficient resources for industrialisation without prompting a flight of capital, thereby endangering access to the surplus that mining was able to make available.

Despite this, the sheer scale and continuity of investment concentrated in the MEC core has led to an engineering sector capable of producing a considerably diverse range of capital goods. Engineering sector developments were determined largely by the joint ventures formed by Iscor with private capital. Mining capital was less inclined to invest in ancillary activities given booming gold prices in the 1930s, but

the onset of WWII led to considerable state coordination of national engineering industry activity for war production.

With the election of the National Party in 1948, efforts at diversification were hampered by the prior objective of creating large-scale Afrikaner capital which subsequently was to overcome the disjuncture between Afrikaner political and English economic power. The erosion of the disjuncture, while varying in rhythm and extent across sectors, was evident in the relations of conflict and compromise between English capital, on the one hand, and Afrikaner capital and state institutions on the other. In the 1940s and 1950s, the latter grew in strength, by the promotion of Afrikaner interests in general but, particularly, through the promotion of Afrikaner capital and its deployment in productive activities which, in the inter-war period, were largely the preserve of English capital.

The process of accumulation around the MEC in the 1950s included the expansion of gold mining, electricity, coal and chemical sectors and the financing of these activities. In the financial sector, compromise with mining capital was evident in the creation of a long-term capital market, necessitated by the collective demands of productive activities within the MEC. Conflict resulted from state patronage of Afrikaner financial interests and similar dichotomies emerged within the electricity, coal and chemical industries. By 1960, activity within the MEC core sectors had increased considerably (a process that was to continue subsequently). GDP contributions from these sectors rose from 18% in 1953 to 21.5% by 1960, while non-MEC manufacturing remained static, fluctuating between 14-15%, (figure 1.6).

Section two covers the period between 1945 and 1960. Engineering activity was driven by a number of factors,

all of which were related to massive expenditure on expanding MEC core sectors. Whereas mining and railway equipment requirements had dominated engineering demand in the inter-war period, specific sub-sectors of engineering, such as electrical machinery, grew through the development of electricity generation capacity in the 1950s. Large-scale capital projects, particularly within the steel and chemicals sectors, also placed increasing demands on engineering capacity.

As a system of accumulation, the MEC represented the means by which Afrikaner fractions of capital sought to involve themselves in mainstream economic activity. While the 1950s saw Afrikaner capital consolidate its position within the financial sector and gain footholds in the coal mining, fuel and chemical sectors as a junior partner, the 1960s witnessed its much wider sectoral penetration of the economy, mainly within the core MEC sectors, and with an increasing interaction between itself and English capital.

The erosion of the disjuncture between English and Afrikaner capital was spurred on by foreign capital withdrawal after the Sharpeville massacre in 1961. It resulted in the interpenetration, firstly, of English and Afrikaner capital and, secondly, of different fractions of Afrikaner capital. However, the erosion was insufficient to support significant industrial diversification out of the MEC, which dominated economic activity and continued to determine the pattern of industrial development. The share of Afrikaner ownership of the mining sector increased significantly in the 1960s. Initially, these were served by coal contracts from the growing state electricity giant, Escom. The acquisition in 1964 of General Mining by Federale Mynbou, with the help of the Anglo American Corporation, signalled a conscious accommodation of Afrikaner by English capital, of compromise in the face of conflict.

This was accompanied by increasing state-led investment in the MEC, around energy, chemicals, processed minerals and armaments.

These divergent influences continued to have an impact on engineering in the decade of the 1960s, as shown in section three. The creation of a domestic telecommunications industry in the 1960s provided some diversification in engineering sector activity but did not significantly affect it in aggregate. The major impetus came from the creation of private sector basic iron and steel industries and their integration with newly acquired engineering companies, in the wake of foreign capital withdrawal after the Sharpeville massacre in 1961. These, together with large-scale chemical and mineral processing projects in the late 1960s, further boosted engineering output.

By the early 1970s, the erosion of the disjuncture between English and Afrikaner capital allowed the state, for the first time since the 1950s, to adopt coordinated industrial policies (discussed in chapters 4 and 5). These revolved primarily around the MEC, following the gold and energy price rises in the early 1970s but coordination was uneven, varying across sub-sectors. In contrast to previous periods, a significantly greater degree of co-operation was evident between private capital as a whole and the state.

A far greater degree of both competition and interpenetration between large-scale English and Afrikaner capital was evident which strengthened private capital as a whole. The emergence of six corporate "axes" of private capital by the early 1980s, signalled the metamorphosis of the historical disjuncture. Each "axis" consists of a conglomerate with extensive but varying interests in the mining, manufacturing and the financial sectors. Each sector is oligopolised by the conglomerates

and that dominance is reproduced through simultaneous control of the financial sector.

In the 1970s, MEC industries benefited from both booming commodity prices and stable and conducive relations governing the profitability of internal markets. Non-MEC industries, while playing a supportive role to MEC mega-projects, either as suppliers of inputs and capital goods or as consumers of intermediate goods produced by the MEC core, were partly boosted by military demand during the Angolan war in the 1970s, and partly cushioned by conglomerate ownership and by tariff protection. This expanding MEC base, together with rising mechanisation of mining, also affected the engineering sector and is discussed in section four.

State industrial coordination during the 1970s, however, has been uneven across sectors and was short-lived. As MEC projects such as mineral processing and Sasol were completed in the early 1980s, export commodity prices declined. Since there was no structural nor institutional basis laid down to diversify into non-MEC sectors, the latter declined according to the fortunes of the MEC (except for some sub-sectors driven by military and mega-project expenditure, whose buoyancy was prolonged until the late 1980s)

There is little empirical evidence of diversification out of the MEC core. Investment in these sectors declined relatively in the 1980s. Non-MEC manufacturing's contribution actually fell from 18% in 1980 to 15% in 1985 but rose slightly to 16% by 1990 due partly to increased engineering sector activity during the construction of the Mossgas project.

A confluence of factors in the 1980s contributed to impeding any diversification out of the MEC. The orientation of the corporate sector and the nature and

structure of the financial sector, together with policies of deregulation in the latter were not conducive to encouraging diversification. With most major mining and manufacturing assets having been acquired by conglomerates in the 1960s and 1970s, a flurry of financial sector acquisitions followed deregulation in the 1980s, consolidating conglomerate power at the level of the financial sector. This is reflected in financial service contributions to GDP rising from 11% in 1980 to almost 15% in 1990, (figure 1.6).

Consequently, the industrial structure and institutional impetus that is based on the MEC has continued to guide South Africa's industrial trajectory into the 1990s. The process is increasingly being driven by private and parastatal industries towards <u>further expanding</u> the MEC core. Furthermore, orientation of state policy makers in the 1990s is increasingly hostile to any active industrial policy to diversify away from the MEC.

The prolonged stagnation of the economy that set in during the 1980s has led to a contraction and restructuring of major sections of the engineering industry within the conglomerate structure that simultaneously straddles the mining, manufacturing and the financial sectors. Thus, the processes by which segments of the engineering industry developed have varied. Some sub-sectors developed as articulations of an expanding MEC core (ISIC 381), while others grew upon demand for engineered goods (ISIC 382-384). Others developed as part of tightly coordinated state strategies, either directly (ISIC 383 telecommunications) or indirectly (ISIC 381-384 armaments). However, despite these varied achievements, there is little evidence of diversification out of dependence on the MEC. Instead, in the 1990s, the pattern of investment seems to be replicating that of the 1970s, focused on the MEC core,

with engineering sectors playing a continuing and subservient role.

TABLE 6.1 - ENGINEERING INDUSTRY CLASSIFICATION

ISIC/(IDC)(1) CATEGORY	
371	IRON & STEEL BASIC INDUSTRIES
(3710)	Iron & Steel
(3710)	Steel Pipe and Tube Mills
372	NON-FERROUS METAL BASIC INDUSTRIES
(3720)	Smelting, Blending,Refining
(3720)	Erection
(3720)	Casting, Pressing,Corrugating
(3720)	Drawing
381	FABRICATED METAL PRODUCTS
(3811)	Cutlery, Hand Tools, General Hardware
(3812)	Metal Furniture, Fixtures of Metal
(3813)	Builders' Hardware, Structural Steel
(3813)	Prefabricated Steel Buildings
(3813)	Sheet Metal Goods
(3819)	Tin Goods
(3819)	Cables
(3819)	Wire and Wire Products
(3819)	Gates
(3819)	Springs
(3819)	Bolts and Nuts
(3819)	Engineering Workshops
(3819)	Welding, Fitting, Turning
(3819)	Electroplating, Anodising
(3819)	Tinning, Galvanising
(3819)	Enamelling, Spray Painting
(3819)	Plastic Coating
(3819)	Sand Blasting of Metal Products
(3819)	Foundry Industry
(3819)	Steel Tanks & Containers
382	MACHINERY, EXCEPT ELECTRICAL
(3821)	Engines, Turbines
(3822)	Agricultural Machinery
(3823)	Metal & Woodworking Machinery
(3824)	Special Industrial Machinery
(3825)	Office&Computing(Mech)& Machinery
(3829)	Refrig.,Washing Machines, Stoves,Ovens
(3829)	Agricultural Tractors
(3829)	Air Conditioners, Refrigeration Plant
(3829)	Ventillation Machinery
(3829)	Other Machinery

ISIC/(IDC)(1) CATEGORY	
383	MACHINERY, ELECTRICAL
(3831)	Electrical Motors
(3831)	Generators
(3831)	Switchgear
(3831)	Switchboard Apparatus (Electromechanical)
(3831)	Elect.Transmission & Distribution Equipnt
(3831)	Electrical Control Instruments
(3831)	Insulated Wire and Cables
(3831)	Lamps and Tubes
(3831)	Fittings and Lamp Connections
(3831)	Conduits
(3831)	Insulators
(3832)	Radio, Television & Communication
(3833)	Electrical Appliances
(3833)	Household Electrical Goods
(3839)	Dry-Cell Batteries
(3839)	Electric Globes
(3839)	Fluorescent Tubes
(3839)	Electrical Goods not classified elsewhere
384	TRANSPORT EQUIPMENT (1)
(3840)	Motor Vehicles
(3840)	Caravans and Trailers
(3840)	Vehicle Bodies
(3840)	Parts and Accessories
(3851)	Shipbuilding(Ships,Freighters, Boats)
(3851)	Marine Engines
(3851)	Ship's Components
(3851)	Ship Conversion, Alteration and Scrapping
(3852)	Railway Locomotives
(3852)	Railway Passenger Coaches
(3852)	Railway Goods Trucks
(3852)	Railway Equipment Components
(3855)	Aircraft Manufacture and Repair
(3854-9)	Motorcyc,Scootrs,Bicyc,Animal Drawn Vehcle
385	PROFESSIONAL&SCIENTIFIC EQUIPMENT(1)
(386..)	Laboratory and Scientific Equipment
	Measuring and Control Equipment
	Photographic and Optical Goods
	Watches and Clocks

Source: IDC (1992).

(1) IDC statistics, shown in brackets (..) are based on CSS modified ISIC categories. Therefore their numbering for Shipbuilding, Railway Equipment and Professional & Scientific Equipment, shown as "3852" can be misleading if compared directly to the International ISIC categories which define similar categories under ISIC 384.

1. THE ENGINEERING INDUSTRY AND THE MEC - INTER-WAR FEATURES

This study considers the "engineering industry" to include those activities identified under International Standard Industrial Classification, ISIC 3800. The main sub-sectors include ISIC 381, Fabricated Metal Products; ISIC 382, Non-Electrical Machinery; ISIC 383, Electrical Machinery, ISIC 384, Transport Equipment and ISIC 385, Professional and Scientific Equipment.[3] Engineering also includes certain activities classified under ISIC 371 (in particular Steel Pipe and Tube Mills) and ISIC 372 (Casting, Pressing and Corrugating), (table 6.1).[4] In this study, ISIC 371 and 372 have sometimes been taken together with ISIC 3800 statistics both to emphasise linkages and because disaggregated data have not been readily available.

In the early part of the century, engineering activity in South Africa was largely dependent on the gold and diamond mining industries and, to a lesser extent, on South African Railways (SAR). Engineering workshops manufactured simple spare parts and repaired equipment.

The creation of Iscor in the mid-1920s, signalled the expansion of the MEC core out of mining to encompass mineral processing. Iscor also provided a great impetus to South Africa's engineering industry. Yet despite the establishment of a steel industry in the early 1930s which rapidly encroached on downstream metal-intensive activities, the South African engineering industry never developed into a sector of importance in its own right. This is particularly significant, given that Iscor's

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3 ISIC 385 is relatively small and is excluded from the rest of this study.

4 These sub-sectors also include the production of consumer goods, for example, stoves, electrical appliances and motor vehicles. Statistics are not detailed enough for disaggregation. However, as will be shown, the forces shaping sectoral development were more related to the MEC than to consumer demand.

output has grown continuously since 1930, both quantitatively and qualitatively, including a range of speciality steels and alloys, which it was forced to produce during WWII.

The reasons for the failure of engineering to develop further have varied over time but are rooted in the disjucture between economic and political power which shaped business strategies in and around the MEC. Mining capitals had preferred that a domestic primary steel industry be built through the expansion of one of their subsidiaries, the Union Steel Corporation (Usco), rather than on the expansion of Pretoria Iron Mines (PIM). They were driven by the desire to lower their input costs of steel as well as to appropriate the benefits of state protection and finance for primary steel production.

Afrikaner capital, in this instance represented by the coalition of interests around PIM, used its access to political power to force a limited diversification out of a dependence on mining, as epitomised by the process which saw PIM expand into Iscor, Chapter 3. Mining or English capital refused to subscribe to Iscor shares and, subsequently, paid more attention to expanding the mining industry after the abandonment of the gold standard in 1932. Iscor was able to expand to meet growing domestic demand at a relatively low cost since provision had been made for expansion in the original design.[5] However, following the great depression, the international steel cartel had reorganised in the early 1930s and began dumping steel on the South African market through a steel marketing system which was controlled by their subsidiaries.

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[5] Iscor's early success was largely due to the favourable timing of the project. Meyer (1952, p.106) points out that "the original works at Pretoria, built during the depression years, cost, on average per unit of machinery, less than half the Vanderbijl Park works which have been built during the current period (early 1950s) of high prices." The Pretoria plant had also been built with provision in its utility systems and site layout for expansion. It was thus able to double capacity between 1934 and 1939 at less than one third the original capital cost.

Iscor soon found itself caught between the scissors of its main domestic client, the mining industry, and its international competitors. It was hit by dumping in 1934, particularly from Belgium, whose steel industry was geared for export. Given the hostility of mining capital, Iscor was forced to accommodate the cartel in 1934 by signing an agreement for five years up to 1940. Iscor Chair, van der Bijl, and the Commissioner for Customs and Excise concluded this in 1936, which reserved for domestic producers, including Iscor, Union Steel, Dunswart and George Stott, a capacity of 350,000 tons/annum of rolled steel products and allocated sales quotas for the balance of the market by country of origin according to percentages of actual imports during 1934. Imported prices would be fixed by mutual agreement but would not exceed British home consumption prices plus cif. It should be noted that British producers were, at the time, among the least efficient. This arrangement benefited all parties except steel users and stunted the emergence of successful and competitive industries utilising steel. The advantages of the cartel arrangement cushioned Iscor's profits, raised state revenues and, were accommodated by mining users because of the rise in the gold price.

It is in this context that Iscor created several engineering industries in the 1930s, downstream of primary steel production with the objective of creating markets for its bulk steel. The marketing of Iscor's planned production of some 100,000t/a, nearly one quarter of the domestic market before 1933, (table 6.2), became a priority in the inter-war period. In 1930, a controlling interest in Union Steel was obtained, providing Iscor with a complete marketing network.

TABLE 6.2 - INTER-WAR STEEL MARKET, ('000)LONG TONS

	1926	1929	1931	1933	1936	1937
Imports	427	553	337	340	544	599
Domestic Pig Iron Production	30	16	9	26	199	272
Domestic Primary & Semis Production(1)	41	51	56	-	291	310
Steel Imports as % tot.Imports	11	11	9	10	10	11

Source: Richards (1940, p.265) compiled from Statistics of the Iron and Steel Industries.

(1) Produced using imports and pig iron as inputs.

A series of major downstream engineering industries were set up subsequently with (mainly) British engineering firms. In 1933, after an arrangement fell through with one of Britain's leading sheet works manufacturers, Lysaghts and Baldwins, Iscor decided to go ahead and build a rolling, pickling, galvanising and corrugating plant itself. Construction had already begun by the time protests were raised in Parliament that Iscor was now moving into secondary product manufacture. Iscor claimed that they would only make 30,000 of the 70,000 tons of products then imported. A joint marketing company for sheets was then created with the import agents called Iscor, Baldwins, Lysaghts Sheet Sales Co. A further 20,000t per annum was routed, via Union Steel, to a pipe making plant. South Africa's first local pipe manufacture had begun in Vereeniging in 1925 to supply the mining industry. The English subsidiary, Stewarts and Lloyds, imported a second-hand seamless tube mill from Scotland. Square billet was sourced from adjacent Union Steel. In 1928 a second mill was installed and, later, a third.

By 1934, primary steel production had begun, (table 6.2), and was absorbed by a booming economy largely through gold mine expenditure. Union Steel's Vereeniging site became Iscor's vehicle for downstream steel processing. Union Steel entered into technical agreements

with GKN to estabish a bolt and nut factory and with Mckinnon Chain Company of Ontario to build a chain factory, both at Vereeniging. The African Cables factory was established in 1935 at Vereeniging. In this way, Iscor bore the main financial risks with the private sector companies providing technical expertise under favourable conditions, and this constituted a pattern of state-led industrialisation that, subsequently, has continued. By 1937, Union Steel production had risen to 70,000t from 20,000t in 1930, Clark (1987, p.114). Downstream industries around Pretoria were also set up such as the Pretoria Steel Construction Company in 1935, a joint venture between Iscor and Hubert Davies to make steel components, mainly for Iscor's own use.

While Iscor formed joint downstream ventures with domestic subsidiaries of foreign capital, it also entered into an accommodation with domestic English capital in ventures that were sited in the MEC mining core. In 1937, Iscor created the forerunner of the ferroalloys industry, the African Metals Corporation (Amcor), initially to mine iron ore on Iscor-owned properties. Although Iscor and Union Steel-owned 50% of the joint venture, other participants included Stewarts and Lloyds, Baldwins, Dorman Long and Lewis and Mark's African and European Investment Company (which also jointly owned Union Steel) and Anglo American Corporation (AAC), Clark (1987, p.114).

Joint ventures with English mining capital also extended to Iscor's coal mining activities. Clark (1987, p.115) reports that this was driven by cost considerations and by Iscor's desire not to be seen to be encroaching on what was traditionally the preserve of English capital;

> the Corporation moved to expand its control over all phases of production, One of its first

> allied enterprises concerned the supply of coal, necessary to produce coke for the blast furnaces. The Corporation held coal-bearing property near Witbank and, fearing being left "entirely at the mercy of coal owners", proceeded to investigate the possibilities of coking these deposits. Finding the coal satisfactory, the Corporation leased its properties to the Johannesburg Consolidated Investment Company (JCI), one of the major gold mining houses, which undertook to supply Iscor with the coal mined from the property. The two companies - Iscor and JCI - then proceeded to establish a third company, the Phoenix Colliery, for the purpose of carrying on the mining. Owning the major assets of the Phoenix Colliery, Iscor in effect controlled the company and the Corporation's supply of coal without incurring production costs or appearing to be expanding into a vertical monopoly.

Thus, the disjuncture encouraged a particular form of engineering activity that expanded in scope to serve the MEC but, at the same time, was impeded from acquiring an independence from the MEC. Iscor was forced to create downstream engineering industries for its main product, because mining capital was not willing to invest in such activity. Yet mining was the main market for engineering's output. Such relations served to constrain diversification and to contain economic activity to the MEC core, impeding the adoption of a cohesive industrialisation strategy until conflict was overridden by the demand for armaments during WWII. Then, a martial organisation of industry and production boosted the engineering sector, but its impact was dissipated after 1945.

But there were other initiatives which did contribute to the expansion of the engineering industry. These included expansions driven by the global operations of multinational corparations and investments driven by domestic non-mining capital. Metal Box and Anglo Transvaal Consolidated Investments are two examples.

In 1933, Metal Box set up a tin box plant in South Africa, a decision driven by global marketing factors and the fear that competitors might establish themselves first. The world tin box market was then dominated by two US corporations, Continental and American Can, who also controlled the can making machinery market. Inter-war British import policies of Imperial Preference thus induced such corporations to set up operations in the Colonies. In 1930, Metal Box had entered into a technological and market restricting agreement with the vastly larger Continental, following a battle for the English market with American Can. The latter, in 1933, was seeking to extend its influence in the Empire through possibly setting up a plant in South Africa.[6]

In order not to jeopardise its U.K. operation, only assembly was undertaken locally and Metal Box imported its tinplate inputs, forging linkages with the domestic primary steel industry much later. In addition, a domestic monopoly was established through a joint venture involving Metal Box(77%), Maythams'(a local family-owned canmaker)(16%) and Continental Can(11%). In the post-war period, delays in machinery deliveries from England prompted Metal Box to build a precision workshop in Epping in 1951.

For a small domestic corporation like Anglo Transvaal Consolidated Investments (Anglovaal), having a foothold in mining was essential in the inter-war period. However, it required large capital investments which the

[6] Reader (1976, p.105).

company did not have. Instead, Anglovaal adopted a strategy of diversification in order both to accumulate sufficient funds to enter the mining industry and also to dampen cyclical cash flows associated with mineral markets. Even so, Anglovaal's diversification was initially confined to industries within the MEC core like cement and bricks, Chapter 3.

The potential for industrial diversification based on domestic steel manufacture was not fuly exploited prior to WWII, partly because of a lack of commitment of English/mining capital. It did not support the establishment of a domestic steel producer based on Pretoria Iron Mines and did not buy into Iscor when given the opportunity, leaving it to the state to take up a majority ownership. The expansion of Iscor in the 1930s was financed by the state, there being little private sector response to take up Iscor debentures. At the time, most private capital investment was routed into the mining industry.

Seifsa (1966, p.12) lamented that, during most of the inter-war period, the Chamber of Mines refused to assist the Transvaal engineering employers organisation by encouraging local manufacture through increasing domestic purchase.

> The Chamber...did not associate industrial development in South Africa with the necessary suppression of costs which was essential to maintain its profit earning basis.

Engineering employers, represented by the Federated Chamber of Industries, were divided according to region in their support for Iscor. Coastal industries feared higher costs of steel from an inland plant whose products would be subject to high rail tariffs, while inland engineering works welcomed the possibility of cheap steel

inputs which they were previously denied by imports subjected to high rail tariffs and by higher cost private sector producers like Union Steel, for example, who had obtained protection for their industries.

Despite the lack of support, engineering, together with Iscor, expanded rapidly in the 1930s to meet booming demand from mining following the abandonment of the gold standard. Iscor capacity was doubled almost immediately after production began in 1933 to 334,000t/a by 1938, about one third of national demand of 950,000 in 1937. The enormous capital requirements for expansion were met through parliamentary allocations, after private investors showed no interest in taking up debentures; £1.0m plus a further £1.5m was raised in this way between 1933 and 1938.

Mining houses, on the whole, focused attention preferentially on expanding mining. One exception was the development of diamond drilling equipment by De Beers, but this "diversification" was integrally linked to the MEC. Firstly, it was driven by the need to sell surplus industrial diamond "boart" or low grade industrial diamonds which were in excess supply in the 1930s.

Secondly, diamond production was at the heart of the economic and political disjuncture in the 1930s. De Beers, by then, had gained control over the global supply of diamonds and had stabilised the market during the depression by drastically reducing output. In 1932, as an indication of the power of mining capital over the South African economy, De Beers ordered the closure of all diamond mines in South Africa. De Beers' Diamond (marketing) Corporation simultaneously reduced diamond offtakes from suppliers outside South Africa.[7] Financing the diamond stockpile valued at £15.1m in 1932 was costly

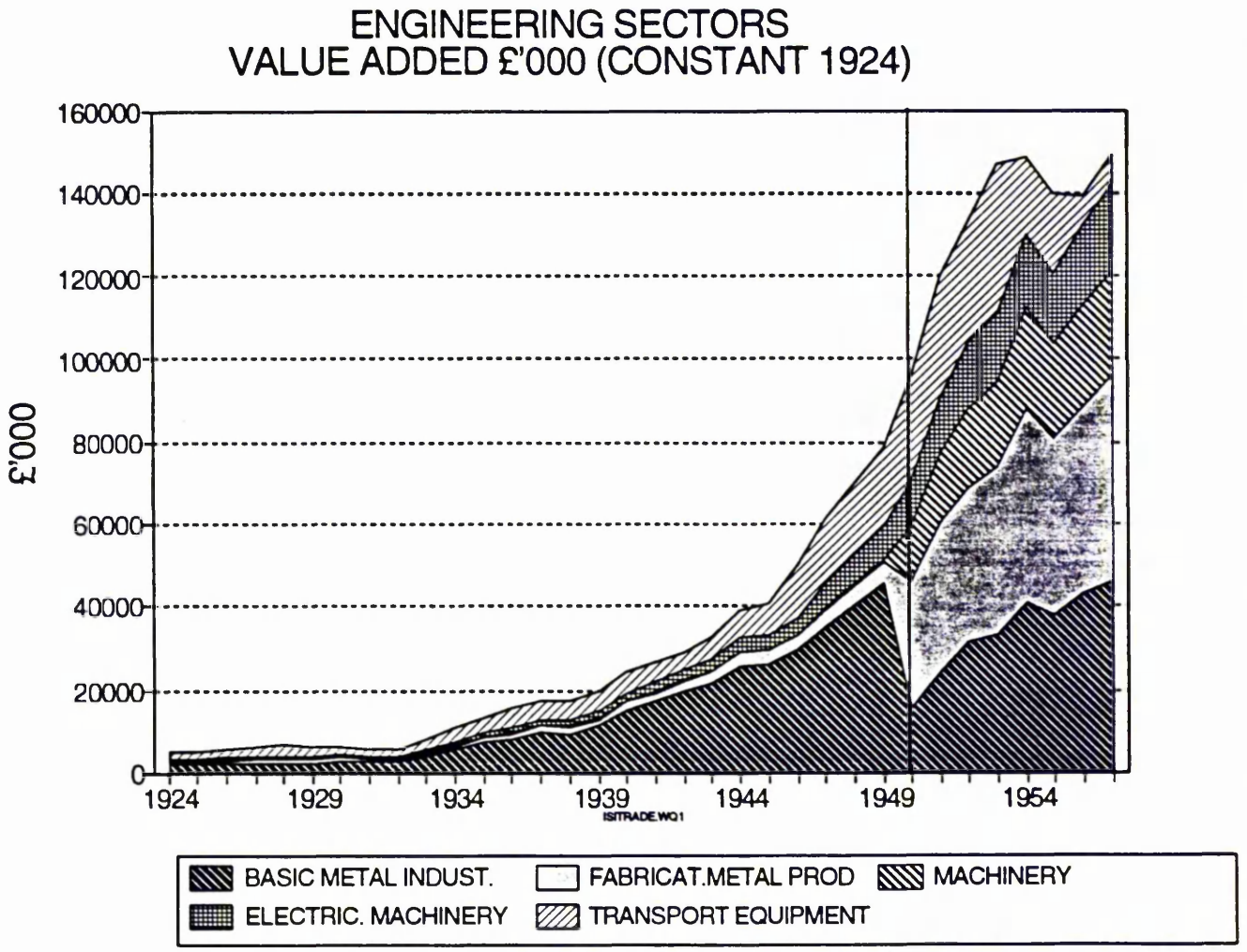
[7] Innes (1984, p.106).

and one of the solutions was to find new applications for lower grade stones.

A major use was in drill crowns in gold mining. In early days, these were made manually by the "drill-runner" on the drilling site by drilling holes into soft steel bit blanks and hammering 3 carat diamonds into the holes. Costs of such diamonds was £27/carat whereas stockpiles of boart were available, mainly from the Congo, at 1/2 crown/carat. The round boart soon replaced the more expensive material following research work done from about 1934 by De Beers.

Boart Products South Africa was founded in 1936 by Ernest Oppenheimer to utilise low grade industrial diamonds. By 1938, Boart had developed a powder press diamond crown which used lower grade, smaller and less uniform diamond "cleavage" whose dimensions did not facilitate hand setting. The powder press also replaced the time consuming manual setting of stones. War production after 1939 raised the demand for industrial diamond products such as abrasive powder for machining hard armament steels and diamond die making for drawing fine electric copper wire for use in radar electronics and materials like tungsten carbide.

FIGURE 6.1 - ENGINEERING SECTOR VALUE ADDED 1924-1958



Source: Union Statistics for Fifty Years (1960).

(1) Transport Equipment is shown but is misleading because it included the activities of garage workshops, spares dealers, panel beaters and spray painters until 1956, when these were removed and measured under other non-manufacturing categories.

(2) The International Standard Industrial Classification system was adopted after 1950, which resulted in considerable reallocation of activities from Basic Metal Industries (ISIC 3700) to Fabricated Metal Products (ISIC 381) and Non-Electrical Machinery (ISIC 382).

In terms of industrial policy, the disjuncture between economic and political power precluded the adoption of cohesive strategies for further developing the engineering sectors for most of the 1930s. But with the demands of war production, this vacuum gave way to a highly centralised, planned and coordinated programme which considerably raised engineering output, (figure 6.1).

About £1m worth of special purpose machine tools were imported and war production was tightly co-ordinated by different state agencies including the Directorate of Supplies, Directorate of War Supplies, the Controller of Machine Tools and the Controller of Ship Repair. Labour shortages prompted the appointment of a Controller of Industrial Manpower and stringent price control was levied on ferrous and non-ferrous material. Factory capacity was appropriated for arms production.

Wartime production also required Iscor to raise output and produce several special grades of steel despite the shortage of equipment. These included armour plated steel and alloy steel for forged gun barrels for howitzers and anti-tank guns. Ship repair requirements drove the construction of the Vanderbijlpark works, with the construction between 1941-1943 of a plate mill. Imported components included electrical equipment and roller tables, Seifsa (1966, p.21). In 1945, Iscor production was 520,000t/a rising to 575,000t/a by 1947.

Most of the efforts of the engineering industry were directed to armaments production during the war for bombs, armoured cars, mortars, hand grenades, military spares and ship repair. Seifsa (1966, p.21) estimates that between 36-56% of Iscor's output during WWII was utilised in armament production for this purpose, (table 6.3). Most of this output was measured under "Basic Metal Industries" category, (figure 6.1).

TABLE 6.3 - ARMS INDUSTRY STEEL CONSUMPTION

	Number	Tons(1)
Armoured fighting vehicles	57000	570000
Military Motor Vehicles	35000	70000
Ships repaired (1939-1945)	12000	60000
Helmets	1500000	750
Shells & shell cases		50000
Mortar bombs, grenades, land mines		28000
Small arms & ammunition		20000
Bombs		70000
Aircraft hangers & bridges		60000
Total Steel Consumption		928750
Annual Average Consumption 1940-1944		185750
% of Iscor 1939 capacity		56%
% of Iscor 1945 capacity		36%

Source: Seifsa (1966, p.16).

(1) Assume fighting vehicles are 10 tons and military vehicles 2 tons each. Assume 5 tons steel used per ship. Assume 2000 helmets/ton.

The joint venture corporation, Amcor, began making ferrochrome for armaments production and the Vanderbijl Engineering Corporation (Vecor) was set up in 1938 to supply heavy castings as components for heavy engineering goods, particularly for the mining and electricity industries, Christie (1984, p.122). The Chair of Iscor and Escom, van der Bijl, was made Director General of War Supplies and chose to continue the relationship Iscor had previously forged with private capital. Iscor concentrated on making bulk billets and supplying these to its private sector partners for further processing.

The private engineering companies that had close relationships with Iscor were the main beneficiaries of contracts for wartime production of guns, cannon and ammunition. The South African government had undertaken to supply the allies with £1m/month of ammunition. By 1942, van der Bijl had installed £3m of equipment in various engineering company workshops. A further £3m was

spent on SAR workshops, the Central Ordinance Factory in Johannesburg and at the South African Mint.

Dorman Long received most of Iscor's armour plate and made military vehicles, bridges and aircraft hangars. Stewarts and Lloyds received massive equipment expenditure and became the country's main shell factory. Usco made bombs in its foundry and bolts, nuts and copper wire. Iscor entered into agreement with about 40 private engineering firms, who added most of the value and made the greater profits, even though Iscor might have been capable of similar activity. In addition, Iscor's production of special steels and alloys raised its costs. Usco profits rose by 30% during the war and Stewarts and Lloyds paid dividends of 20%. Conversely, those engineering firms not associated with Iscor did not receive major defence contracts and their profitabilty suffered including Dunswarts, George Stott and Scaw.

Clearly then, the engineering sector prior to WWII had expanded to meet the changing requirements of the MEC, which itself was diversifying out of gold and diamond mining. The demands of war production further expanded the scope of engineering activities but contraction immediately followed the dismantling of the martial system of coordinating war output.

2. THE ENGINEERING INDUSTRY AND THE MEC - 1945-1960

After the war, the cohesion around war production dissipated and most of the machine tools used were sold to private and joint venture companies in which they were installed. This consolidated their position in the domestic market at a time when imported equipment was in short supply given the reconstruction needs of Europe. Thus Iscor continued its coordinating role and the expected post-war recession for engineering did not materialise. Instead the engineering industry expanded on growing demand from the mining industry, particularly the Orange Free State gold field (FSG) development, from uranium production facilities and from secondary industries.

In the post-war period, Afrikaner capital concentrated on the pooling of finance, in the first instance, and, secondly, in directing it increasingly at large-scale investment projects, particularly around coal mining and chemicals. English capital, on the other hand, focused on developing the FSG. The industrial policies of the National Party (NP) government, after its election in 1948, were mediated by the need to support the empowerment of Afrikaner capital, on the one hand, and to respond to mining capital's demands for railway and electricity infrastructure, on the other.

The provision of the latter in turn raised demand for engineered equipment as did demand from mining capital's development of the FSG and other expanding MEC industries in the 1950s, including uranium extraction, coal mining, electricity generation, railway infrastructure and rolling stock, oil refining and chemicals production. One component of state industrial policy, namely the creation of state corporations around the MEC, continued into the 1950s with the creation of

the Sasol fuel-from-coal plant, which itself placed demands on domestic engineering industries.

Thus, while engineering industries flourished, there were no coordinated or cohesive industrial policies which were designed to ensure its continuation independently of the MEC. In the 1950s, then, a considerable expansion of the engineering sector took place. Value added more than doubled in the decade, from £70m to £160m. The bulk of activity was in ISIC 371 (Iron and Steel Basic Industries), ISIC 372 (Non-ferrous Metal Basic Industries) and ISIC 381 (Fabricated Metal Products). But growth in ISIC 382 (Non-Electrical Machinery), ISIC 383 (Electrical Machinery) was considerable, with value added rising from £22m to £55m. ISIC 384 (Transport Equipment) data prior to 1956 included a range of trading activities like motor spares dealers and was misleading in indicating manufacturing activity.

In this policy vacuum, Iscor, through its control of bulk steel, exercised considerable influence on the structure of the engineering sector. It did this in two ways. Firstly, the expansion of Iscor provided a major boost to post-war engineering sector growth. In 1945, Iscor production was 520,000t/a rising to 575,000t/a by 1947, recorded under Basic Metal Industries, (figure 6.1). Anticipated demand after WWII led to the expansion of Vanderbijlpark by more than 360,000t/a. This was subsequently raised and by 1952, 1.2mt of ingots were being produced at both works, representing about 850,000t of finished products.

While this matched consumption, Meyer (1952, p.104) points out that "throughout the post war period, there has been much unsatisfied demand for steel", and Falkena (1980, p.18) points out that steel prices were controlled and constant between 1952 and 1970 in order to stimulate downstream usage. This also had the effect of lowering

Iscor profitablity, leading to the need for Iscor to raise capital on local and foreign markets to fund deficits. Meyer (1952, p.105) refers to the

> ...widely credited fallacy that the South African Iron and Steel Industry enjoys great natural protection in the South African market ... capital charges are greatly inflated by the cost of importing most of the plant and equipment ... the capital cost per unit of machinery of Iscor ranges from 50 per cent to 100 per cent more than that of leading American steel firms and approximately similar differences would appear to exist between South African and British cost ... this difference must be attributed to that costs of importing (insurance, freight, customs duties, landing charges, etc., and the cost of administering the importations).

Secondly, Iscor continued to set up joint downstream engineering sector ventures in the years following WWII. Iscor used the fact that steel was in short supply internationally to change its terms of trade with customers. Clark (1987) records that Iscor subsidiaries Usco, Amcor and Vecor were assured of supply, but their competitors were not and had to rely on high priced imports, if available. At the time, 80% of local orders were filled by Iscor with 20% imported. Iscor's long time partners, Stewarts and Lloyds and Dorman Long, received preferential treatment. The mines received most of Iscor's sheet steel output and half of Iscor's rail output, the SAR receiving the balance of rail and pig iron output.

In 1947, private (and unprivileged) engineering firms, Dunswart (owned by Anglovaal), Scaw Alloys (owned by several mining houses) and Wire Industries (owned by

Fedvolks) threatened to set up their own steel works. Iscor responded by doubling pig iron allocations to Scaw, who then sold processed billets to Dunswart. Wire Industries proposed setting up wire manufacture in competition to Iscor's planned wireworks, which would meet total national demand. In 1950, Iscor and Fedvolks agreed to a joint venture to rationalise the industry.

Thus, though the forward linkages forged by Iscor's joint ventures with private capital,engineering activity within the Fabricated Metal Product sub-sector (ISIC 381) grew considerably, (figure 6.1). When the ISIC standard was adopted in 1950, more than half of what was previously measured under the Basic Metal Industries was reallocated to ISIC 381. Table 6.1 indicates the type of activity associated with ISIC 381, namely a mixture of simple to complex metal working sub-sectors.

One of the more important generic industries within ISIC 381 is the foundry industry, which has forged further linkages with other sub-sectors within engineering. Webster (1985, p.56) records both internal changes and increased output from the foundry industry in the post-war period. Quoting Thomson (1946, p.114):

> Before the war the majority of South African foundries were engaged mainly in jobbing work and it was the general practice for moulding to be carried out by hand. The repetition work involved in the execution of large orders for the Director General of War Supplies has stimulated the use of foundry machinery.

While Webster is concerned with the impact this had on craft unions which organised foundry labour, the post-war period up until 1960 did not witness any significant changes in the organisation of the foundry industry, which exhibited a bimodal ownership structure. A number

of large foundries dominated a considerable proportion of output, while the balance was made up by many small jobbing foundries. The main markets served in the 1950s were the expanding mining industry and the increased expenditure on railway and power generation capacity.

Scaw metals, for example, diversified in the 1950s. In 1949 a steel foundry was erected and a ball forge commissioned in 1951 to provide grinding media for the expanding mining industry. A technical agreement was concluded with General Steel Industries of USA and UK Steel Castings Corporation in 1956 for technology to cast steel bogies and other components for the expanding railway system. Simultaneously, a technical agreement with Abex Corporation (USA) facilitated the manufacture of freight car wheels and later earth moving and heat resistant steel castings, Innes (1984, p.197)

Engineering expansion, then, was directly related to the MEC and most of the sub-sectors that emerged were also limited by a dependence on the MEC continuing into the 1990s. One exception to this was the example of De Beers subsidiary Boart.[8] Unlike many other domestic engineering industries, Boart's motivation was historically driven by factors around the global diamond market. Immediately after WWII Boart began acquiring companies operating mainly in the USA and Canadian markets which utilised diamonds/boart in advanced technological applications. They began with the takeover of the cast set-drilling crown factory in Johannesburg of Boyles Brothers of Salt Lake City. Boyles had just been taken over by the Barlows group at the time. Subsequently, a direct share in the Salt Lake City company was acquired by Boart.

An association was formed with Christensen Diamond Products of Salt Lake City in 1953. Christensen was a

[8] Most data are sourced from Boart (1986) and various editions of Boart International News.

buyer of Boart's diamonds and were experts in diamond tool manufacture for oilfield drilling. This gave Boart access to Christensen's growing international network and later led to closer relationship with Longyear, which was subsequently acquired by Boart. At the same time Boart Hard Metals bought Gardiner Steel of Noranda Quebec and Canadian Rock to access the Canadian mining industry market. In 1960, Boart set up a plant in Southern Rhodesia and also in Zambia in 1963 after breakup of the federation to make diamond crowns, hand hard metal tools and provide contract drilling.

Contract drilling has been a major part of Boart's activities. Anglo American's development of the Free State Goldfields in the 1950s provided Boart the opportunity to build its contract drilling service division. The service was later extended to other mining houses. In 1951, Boart pioneered a contract sales system for long term stability of tungsten carbide and diamond tipped products, selling drill steel by footage drilled rather than on an individual basis. By 1955, their Crown Mines factory was making 8,000 drill crowns/month and the Springs plant, 60,000 drill stems/month. In subsequent years contract drilling became a central part of Boart's global expansion.

In 1947 Boart began making diamond saws (for cutting sandstone) and wheels at a new factory in a joint venture with Impregnated Diamond Products of Gloucester. An association was also formed in 1960 with the Wendt Company of Germany, which made diamond impregnated grinding wheels and grinding machines. The Hard Metals Company, formed in 1949, marked Boart's diversification into tungsten carbide tipped mining tools. It began with an unsuccessful approach to Swedish tungsten carbide technology leaders. Boart subsequently formed an association with UK's Murex Ltd. Hard Metals became the largest manufacturer of cemented tungsten carbide

products in the Southern Hemisphere and the core of an important part of Boart's operations.

Initial products were chisel rods for rock drills. Boart had already developed experience during the war years of tungsten carbide applications in armour piercing shell, metal forming dies, synthetic diamond manufacturing components and machine tool inserts. Tungsten carbide still remained a small part of Boart's operations. In 1951, 75% of profits still came from sales and processing of industrial diamonds.

In terms of the engineering industry as a whole, Boart's apparent "success" in becoming an international engineering company is clearly an exception, due to its ownership links and because of the monopoly control that De Beers had held over the global diamond market. While Boart itself globalised its operations from an early date, it did not play any significant role in advancing South African engineering output beyond the production of drill steel and drill bits for local consumption. In the 1960s, it transferred considerable manufacturing operations to Shannon and, in the 1990s, has also shifted research operations to Ireland.

However, engineering activity also extended to more complex goods from an early stage. Prior to WWII, the only Electrical Machinery activity (ISIC 383) of note was in armature winding and repairs. The scope of activities expanded during WWII with the production of batteries, electric motors, transformers, cables, motor-starters, cranes and searchlight generators. Most of these plants were set up by subsidiaries of multinational corporations.

After the war, even before the introduction of import tariffs and controls, the English Electric Company decided to set up local manufacturing facilities,

inviting Roger Price, son of Bernard Price head of the power utility, VFTPC, to establish the factory. English Electric initially made small electric motors at their Benoni factory. By 1958, it was manufacturing radio transmitters and components, mine pumps, mine winders, locally designed radar sets, power station switchgear, Marconi communications equipment, industrial closed circuit television, 400kva transformers and large electric motors, Christie (1984, p.158). The local subsidiary of British GEC expanded its plant after the war to make railway signal gear, X-ray machines and gold mine air compressors. Philips began light bulb manufacture in 1947 and by 1958 had established a local electronics research laboratory. Siemens, who had established a local import agency in 1923, was manufacturing electrical switchgear by 1957 and opened its Waltloo telephone factory in 1961. By 1960, output from the Electrical Machinery sub-sector had grown considerably, (figures 1 and 2).

From the mid-1950s up until the early 1980s, South Africa was one of the world's most important markets for railway equipment, ISIC 384. In 1957, Union Carriage of Australia, set up a subsidiary in South Africa to manufacture locomotives, coaches and wagons with production beginning in 1959. Railway equipment production, recorded under ISIC 384, (table 6.1), involves a number of interlinked activities across the engineering sector. A considerable proportion of railway equipment components would be sourced from ISIC 381 where, for example, wagon wheels, bogies and other items would be cast in the foundry sector. ISIC 381 would also produce bolts, nuts, springs and sheet metal goods and might also provide suitable treatment of finished components by, for example, anodising, galvanising, electroplating, sand blasting or spray painting assembled components. Thus the expansion of the Fabricated Metal Products sector in the 1950s should be attributed to the

forging of downstream links from the MEC core as well as expanding to support other engineering industries in ISIC 382, 383 and 384.

2.1 FINANCING THE ENGINEERING SECTORS

Up to the 1950s, the major sources of domestic capital were internally generated through mining profits centralised within the mining finance houses, particularly within Anglo American. Major capital expenditure was locked up in developing the Free State Goldfields for much of the 1950s, Christie (1984, p.160). While conventional wisdom holds that it was the availability of finance that constrained the development of manufacturing, generally, this is based on a conceptual divide between financing mining in preference to "manufacturing".[9] In fact, it has been the MEC core which has always been accorded priority in financing, in turn, driving other sectors through linkages of ownership, inputs and outputs.

Meyer (1952, p.106), in partial recognition of this, illustrates the crucial trade offs that were being made at the time over capital allocations, that these largely concerned capital-intensive core sectors of the MEC;

> The Union appears to have been in a better position recently as far as investment capital is concerned than it has been in the past few years, but the supply is not unlimited and there are many claims to be satisfied including those from the Gold Mines, the oil from Coal Industry, etc. Recent events have shown that, to name but two, the South African Railways and Harbours and the Electricity Supply Commission, require considerable sums for capital development. Both these organisations supply

[9] For example, see Dickman (1973).

> essential services to the Steel Industry and there is no doubt that the very considerable demand which the Steel Industry makes on them adds substantially to the severe burden on their resources. Were Iscor, irrespective of other needs, to enter the capital market for the £25,000,000 to £30,000,000 which would be required for a new steel making unit, the capital available to these and other service organisations would be reduced while, by the same token, the demands made upon them would be considerably increased. This is but an illustration of the consideration which must be given to preserving balance in the growth of our industrial economy.

As has been shown, a large portion of the engineering industry was financed by an articulation of Iscor's steelmaking activity. Many of these industries were joint ventures with, either, domestic or foreign capital. Other engineering industries were established by non-mining capital, usually subsidiaries of British, US and German multinational corporations, Christie (1984, p.158) to take advantage of burgeoning expenditure around the MEC. However, the divisions have been shown to be blurred, considering the interlinkages within engineering sub-sectors.

Where direct MEC activities were involved, even mining capital was not averse to developing engineering sectors, as the Scaw and Boart examples show. International capital also did not miss the opportunity of growing markets within the expanding MEC. In the early 1950s a consortium of nine US banks put up a $20m loan to the Union in anticipation of big orders for US mining machinery, Innes (1984) quotes Henry (1963, p.288). Thus the financing of engineering industries should be viewed broadly as a combination of state, domestic and

transnational activity, which was largely sustained by domestic profits. Norval (1962, p.96) argued that most foreign subsidiaries within the manufacturing sector were funded from internally generated funds.

In conclusion then, considerable expansion of engineering activity took place between 1945 and 1960. However, in the context of the overall economy, diversification out of the MEC and further into engineering was constrained, as in the inter-war period. This was despite developments in drilling and cutting technology, the ability to manufacture a wide range of speciality steels and to engineer them into a range of military equipment and civilian activities such as ship repair and the capacity to manufacture a considerable range of mining and electrical equipment. The potential of this sector was evident during WWII when policies of coordination and the pooling of resources demonstrated an enormous capacity to expand and innovate.

One of the reasons for the failure to build on these achievements lies in the disjuncture between economic and political power, identified in Chapter 3, which is shown above, for example, to have given birth to Iscor and simultaneously limited the scope of its diversification. After WWI, Afrikaner capital strengthened itself by pooling finance in the first instance and, secondly, directing it at large-scale investment projects, particularly mining. English capital's attention was occupied by the FSG development until the mid-1950s. After this, investments in downstream industries increased, largely through acquisition following post-Sharpeville disinvestment and through major investment in the MEC core.

Although local manufacture was encouraged, the mechanisms varied with different approaches for certain sectors. Iscor continued to coordinate a large part of

the engineering sector through joint ventures. In strategic sectors such as fuels and chemicals, intervention was more direct, with the creation of Sasol in the mid-1950s. For telecommunication equipment, the industry was started under a long-term state-TNC agreement for local manufacture, which subsequently involved Afrikaner capital. Beyond using its purchasing power for telecommunication equipment, few other supportive policies were pursued - even sub-sectoral monitoring of productivity, evaluation of the impact of policy on sector development, etc. were never carried out. So, by the record of the policy implementing agencies of the state themselves, industrial policy was poorly managed, Chapter 5.

Tariff protection is often advanced as a motivating factor for the establishment of domestic manufacturing, particularly the production of easily substitutable consumer goods. In the case of the engineering sector, the main motivator in the 1950s was, in fact, the expansion of MEC activity through the FSG gold field development, the expansion of supporting electricity and railway infrastructure and increasing capital and energy-intensive manufacturing industries. The achievements in engineering should also be viewed in the context that capital goods have historically been exempt from tariffs.

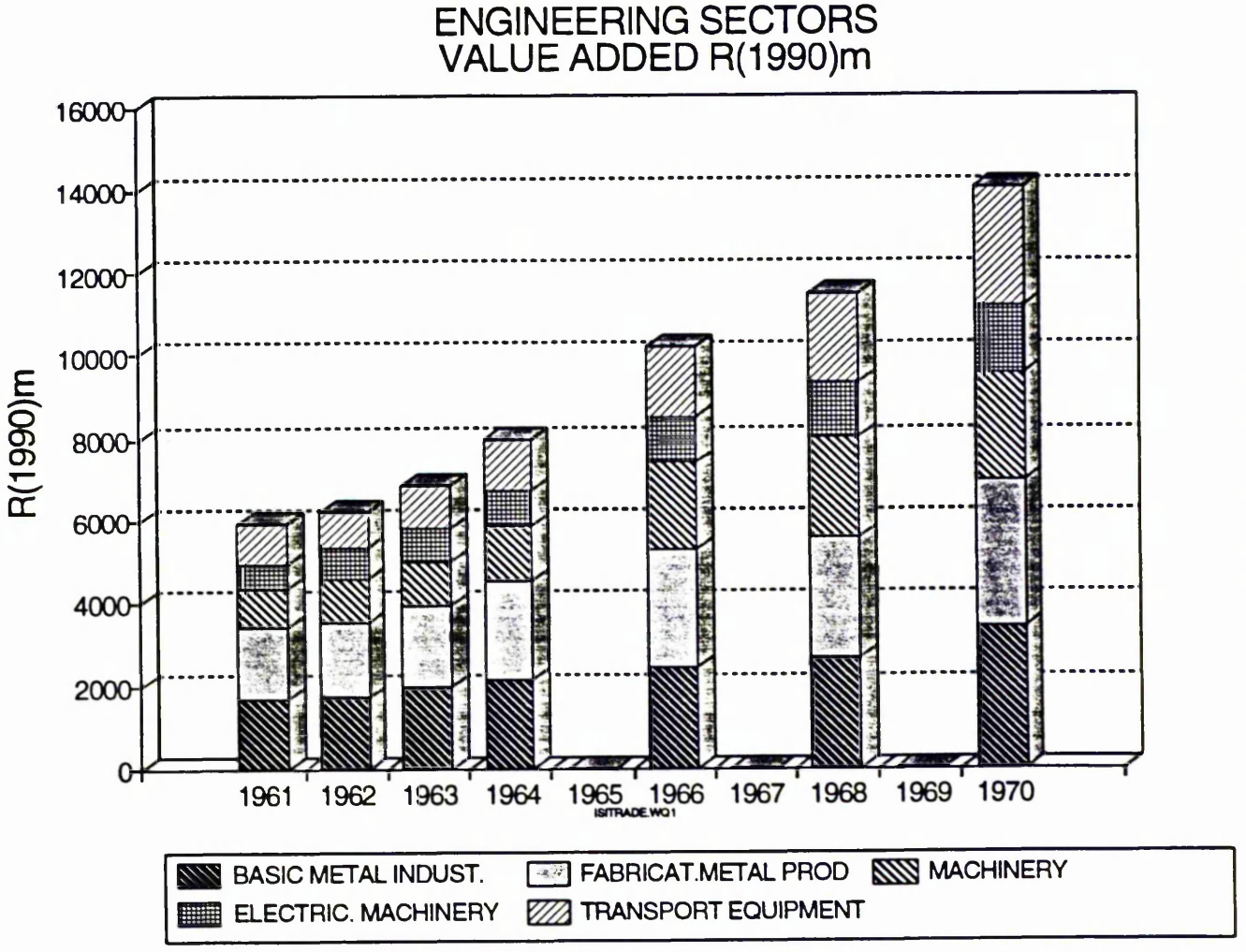
3. THE ENGINEERING INDUSTRY AND THE MEC - 1960-1970

The decade between 1960 and 1970 is acknowledged as one of high manufacturing sector growth. Elsewhere, it has been argued that much of this growth was associated with the expansion of core MEC sectors, Chapter 4. Some segments of the engineering industry grew faster than others during that period but, in the main, none of the engineering sectors acquired a momentum independent from the MEC.

During the 1960s, engineering sector growth varied across sub-sector according to different influences, (figure 6.2). Disinvestment after the Sharpeville massacre in 1961 was absorbed by both English and Afrikaner capital who acquired footholds in a large number of manufacturing sub-sectors. Here the ownership component of the MEC came to the fore. As conglomeration and concentration of ownership increased across all sectors of the economy, it partly facilitated increased capital-intensive industrial activities and production methods, such as mechanised mining and these, in turn, stimulated the engineering sectors.

Major investments were made in the 1960s in the Basic Iron and Steel sector by private, mainly English capital. These integrated steel works were extensions of their mining operations and, as Iscor had done in previous decades, these were vertically integrated with existing downstream operations and new acquisitions in the engineering sectors, particularly ISIC 381.

FIGURE 6.2 - ENGINEERING SECTOR VALUE ADDED 1961-1970



Source: South African Statistics (1990).

(1) Transport Equipment, ISIC 384, includes the Automotive industry.

Investments in mining, mineral processing, chemicals and infrastructural expenditure on railways to support the MEC continued. These placed demands across all engineering sectors, particularly ISIC 381 and 382. Electrical equipment, ISIC 383, was most affected by two main activities namely, electricity generation expansion and the state's industrial strategy for telecommunication self-sufficiency. However, the strategy was limited in scope and failed to achieve a dynamic of its own by the end of the decade when local manufacture was outmoded by new technologies.

The growth of the automotive industry (ISIC 384) also took place in the 1960s and placed increasing demands on the engineering sectors, particularly ISIC 381. The local content programme is acknowledged to have failed because of its fragmentation and this, not only in the motor industry but in all supporting engineering sub-sectors, precluded the achievement of economies of scale and undermined the prospect of the automotive industry leading a sustainable diversification out of the MEC core.

3.1 GROWTH IN ISIC 371, BASIC STEEL OUTPUT

Major investements were made in the Basic Iron and Steel industries in the 1960s which had cascading effects on the engineering sector, (figure 4.4). Firstly, Iscor made significant and continuous investments in their existing plants. Secondly, private capital entered the primary steel sectors and simultaneously began to integrate this with upstream and downstream operations.

The Anglo American Corporation established the Highveld Steel and Vanadium Corporation in 1961. It was

their largest industrial undertaking in the 1960s with capital expenditure of R127m around 1963. The plant was designed by Davy United of Sheffield with technology licenced by Newmont Chemical of the USA, Innes (1984, p.195). The plant was integrated with AAC's upstream iron and coal mining operations, with iron ore being railed in from the Mapochs mine 160km away at Roossenekal. Highveld's capacity at the time was 360,000t/a of pig iron which was used to produce 300,000t/a of rolled steel sections and 18,000t/a of vanadium pentoxide (V2O5) slag.

Integration also took place with downstream industries owned by AAC. In the 1960s, the engineering sectors were affected by the general spate of mergers and acquisitions. The Anglo American Corporation, for example, bought downstream users of steel like Scaw Metals, Union Carriage and Wagon, Stewarts and Lloyds and Hall and Longmore, Innes (1984, p.195). Scaw was taken over in 1964 by Amic. At the time it was a major producer of steel parts and grinding media for the mining industry and AAC's move essentially mirrored Iscor's actions in the 1930s when it created downstream industries in order to find a market for its increasing production. In 1966, Scaw expanded by R10m.

A second boost to the engineering industry came from Rand Mines' subsidiary RMB Alloys who began producing ferrochrome in 1962 and expanded this capacity at Middleburg in 1964. In 1965, an R80m stainless steel plant, Southern Cross Steel, also known as Middelburg Steel and Alloys (MS&A), was built on the ferrochrome plant site.

Ferrochrome was first manufactured in South Africa by Iscor's joint venture, African Metals Corporation, during WWII for armament production. The modern ferrochromium industry began in 1960 when Amcor bought Ferrometals, Witbank which was producing high carbon

alloy for use in stainless steel production. At the time the stainless steel refining process required a high chrome (65-70%) low carbon(0.5%) ferrochrome but new technology in the Argon-Oxygen-Decarburisation (AOD) steelmaking process allowed the more abundant low chromium (52-55%) high carbon (6-9%) alloy to be used (charge chrome). Amcor expanded the Witbank plant to produce this. Other competitors followed and by 1979, six smelters were in operation with national capacity of 940kt.

3.2 MINING MECHANISATION - COAL MACHINERY AND MATERIALS HANDLING EQUIPMENT

The mechanisation of mining processes increased in the 1960s and accelerated in the 1970s. The greatest developments took place in coal mining, inititally, with underground mechanisation and, subsequently, through open-cast mining operations each of which required different equipment, (figure 4.8). Coal production has been an integral component of the MEC, involving considerable coordination by the state through Escom's purchasing policies and direct and indirect state control of exports, Chapters 4 and 5. However, the scope of such coordination was never extended to the engineering sectors producing mining equipment, although the latter demonstrated a considerable capacity to produce complex machinery.

Various coal mining methods require specific types of equipment, (table 6.4). Essentially, underground mining consists of a series of unit operations involving cutting, blasting, loading and conveying coal out of the mine. In addition, most South African coal has a high ash content making it unsuitable for export unless upgraded through a subsequent crushing, sizing and/or washing process. Open-cast mining requires a different set of

equipment; excavators and draglines to expose the coal seam and trucks to remove the coal from the site.

TABLE 6.4 - COAL MINING EQUIPMENT PER MINING METHOD

	Bord & Pillar Mechanised	Bord & Pillar Continuous	Longwall Continuous	Open Pit Mine	Strip Mine
Coal Cutter	*				
Continuous Miner		*			
Shearer			*		
Face Drills	*				
Gathering Arm Loader	*				
LHD's	*				
Shuttle Cars	*	*	*		
Roof Bolters	*	*	*		
Fans	*	*	*		
Feeder Breakers	*				
Switchgear	*	*	*		
Dozers				*	*
Excavators				*	*
Trucks				*	*
Walking Draglines					*
Rockdrills				*	*
Front end Loaders				*	*

Source: Mostert (1982).

* represents the use of equipment in the particular process.

Christie (1984, pp.20-21) has identified labour resistance and periodic shortages of labour as major determinants in the mechanisation of coal cutting activity, the most labour-intensive activity of coal mining. While hand cutting of thin coal seams was cheaper, many colieries used hand cutting methods and electric chain coal-cutting machines simultaneously to ensure a steady output of coal during periods of labour shortage. Coal cutting was almost completely mechanised by 1930, less so in Natal where seams were narrower and more suited to hand cutting than in the Transvaal, (table 6.5).

TABLE 6.5 - COAL CUTTING MECHANISATION

	TRANSVAAL % Mines Mechanised	NATAL % Mines Mechanised
1912	60	60
1920	80	
1925	88	
1930	94	70

Source: Christie (1984).

Due to the combustibility of coal, special explosives are used for blasting. Coal removal originally took place by hand loading, by horse and by shuttle car. While mechanical loading had replaced hand loading in the USA by 1930, most South African coal mines used labour-intensive methods until the 1950s, when coal output rose in accordance with electricity demand. By 1960, self-loading shuttle cars were in common use, carrying a maximum of 22 tons up to a conveyor belt.

Major changes took place in the coal industry from the early 1970s as output increased dramatically, (figure 4.8). Growing interpenetration of large-scale capital by the 1970s allowed the state, English and Afrikaner capital to focus jointly on achieving economies of scale in coal production to serve electricity generation, synthetic fuels and export markets. A shift to continuous mining took place in the early 1970s, replacing the cutting/blasting/loading cycle, which also coincided with rising labour resistance and rising labour costs.

These changes provided impetus to developments in the engineering industries. Although the extent of domestic production of mining machinery varied according to equipment type, a variety of complex machinery has been produced from an early period. The argument here is that, firstly, engineering capability was inextricably

linked to the MEC and that, secondly, the commonly accepted chronology of import-substituting industrialisation (ISI) beginning with the "easy" consumer good stages and ending with "difficult" capital goods production was not followed in South Africa. Thirdly, the potential to develop engineering sectors on the basis of MEC demand was never encouraged by coordinated industrial stategies.

Boart's foray into coal mining machinery began in 1963 with the acquisition of 50% of Bereg Engineering, makers of coal cutters and coal loader chains. Bereg, jointly owned by the General Mining and Finance Corporation, became Boart Mining Chains, and later became knows as Coalequip. However, in keeping with its international orientation, in the mid-1960s, Boart also expanded its Shannon factory with a carbide sintering and carburising plant to make carbide tipped mining tools and extension steels for the European and US markets.

Even before the 1960s, the Joy Manufacturing Company, was manufacturing complex, continuous coal mining machinery locally. Its origins were as the local agent for the Sullivan Machine Company, established in 1929 as the agent for mining machinery, mainly scraper winches. Local manufacturing of scraper winches and diamond set crowns for the coal and gold industries began in 1936, partly as a response to import controls. Imports were restricted by import permits and coal mining was not considered an essential industry at the time.

Joy Manufacturing Company of the USA bought Sullivan in 1945. At the time, Sullivan offered the only mechanical cutter available locally, and this allowed Joy to offer completely mechanised coal mining systems. By 1950, two domestic coal mines were completely mechanised. The first locally manufactured loader was made in 1956. Shuttle cars and cutters were made locally by 1958 and

the first continuous miner was imported in the 1960s. The demand for continuous miners grew as coal mining mechanisation increased. Between 1980 and 1984, 28 units were imported. In 1979, the first continuous miner was made with 65% local content by value.[10] By 1982, Joy had become the biggest supplier of underground trackless coal equipment. Today the local content is 98% by value with exports projected at 10-15% of turnover. Included among the in-house operations are electric motor manufacture, electronic equipment, gears, hydraulic systems, cutting, machining and assembly, straddling ISIC 381-383.

However, the lack of industrial policy coordination around this sector is evident when one considers that of the 400 continuous miners with replacement value estimated at R1200m supplied by Joy by 1991, only a small proportion have been made locally, despite the capability outlined above. Between 1984 and 1989, only 32 units were locally manufactured.[11]

The lost opportunities to develop sectors, such as continuous coal mining machinery sector, on the basis of large anticipated demands from MEC core sectors is duplicated across a number of other engineering industries. Some 42% of coal is currently produced by open cast methods compared to 26% by continuous underground mining and the former techniques have driven a different segment of the engineering industry, (table 6.6, see earthmoving equipment section below). Although apparent at an early time, these trends in mining technique did not prompt the adoption of coherent policies to exploit the potential benefits.

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[10] South African Mining and Engineering Journal, Johannesburg, 11/82.
[11] Engineering Week 21-7-89

TABLE 6.6 - SOUTH AFRICAN COAL MINING TECHNIQUES, 1990

		Million Tons
Open Cast		87
Underground	Longwall	9
Underground	Conventional	58
Underground	Continuous	53
		207

Source: Joy Manufacturing Interview (1991).

3.3 AUTOMOTIVE INDUSTRY CREATION

In 1960 the Minister of Economic Affairs initiated a BTI study into the motor industry. The industry had few local inputs and was essentially an assembler of completely knocked-down kits (CKDs).

> For some time the metal industries had supplied limited components to motor assembly plants but not to any large extent, only a few firms engaging extensively in this type of manufacture. Seifsa (1966, p.27)

Subsquent tariff assistance led to the formation of more than 300 component manufacturers by 1967. This targeted industrial strategy was the second major industrial strategy involving the downstream use of steel, the first having been Iscor's creation of downstream joint ventures. However, coordination of this strategy was left to the private sector to organise and, as a result, the strategy was incomplete. One result was a fragmented components industry, particularly a fragmented foundry industry, see below. Although, the process of mergers and acquisitions accelerated in the 1960s, particularly around the steel and engineering sectors, it was both insufficient in extent and not accompanied by a range of additional policies to encourage greater productive efficiencies so that

engineering industries would be able to follow a path independent of the MEC.

In the case of the motor industry, many commentators have cited the local content programme, initiated in the early 1960s, as providing a boost to engineering industries and the manufacturing sector.[12] The evidence, presented in figure 4.7, indicates that the impact has perhaps been exaggerated, in relation to the MEC. Apart from the direct growth in GDP contribution of about 1.8%, the motor industry would have stimulated growth in the Fabricated Metal Product sector and in the Non-Electrical Machinery sector. While the latter two grew, respectively, to 2.2% and 1.6% of GDP, they are equally likely to have been stimulated by the impact of large-scale MEC projects during this period, Chapter 4.

Efforts made to diversify out of the MEC were not effective. Between 1960 and 1970, the GDP contribution of non-MEC manufacturing sectors rose from 15% to 17.5% and then fell below 16% in 1972. Only part of the 2.5% non-MEC growth can be attributed to the motor industry (0.6% GDP directly), the other significant contributor being the textile industry (0.4% GDP).

In the case of textiles, growth during the 1950s was partly encouraged by, now discredited, apartheid decentralisation policies.[13] By the early 1960s, the lessons of this experience were abundantly clear to the IDC, the creator of the industry in the 1950s.[14] However, the linkage effects created by the new SANS nylon plant in 1964, itself part of the MEC chemicals sector, provided a boost to the downstream textile industry, (figure 4.7).

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[12] The IDC provided direct support by forming Wispeco, a joint venture with Australian Repco, to manufacture motor components.

[13] See Clark (1987, p.335).

[14] See van Eck cited by Gerber (1973, p.113).

3.4 ELECTRICAL EQUIPMENT

In the 1960s, a second strategy was implemented which had an impact on the Electrical Equipment sub-sector of engineering, ISIC 383. A major influence on ISIC 383 has always been the electrical generation and distribution sector, with demand for such items as generators, switchgear, transmission and distribution equipment, (table 6.1).

This strategy concerned telecommunication equipment, in particular, electromechanical switchboard equipment, (table 6.1). It was initiated by a military committee and subsequent sectoral growth was driven and governed by the South African Posts and Telecommunications Department (SAPT) who formed a long-term joint venture with transnational telecommunication equipment suppliers, Kaplan (1990, pp.28-45). The specific form taken by the joint venture was a 10 year contract from 1959 to supply all domestic market requirements, through the SAPT, at prices which guaranteed the private companies a fixed profit margin.

> In terms of the first Manufacture and Supply Agreement, SAPT guaranteed minimum purchases were about R30 million per annum, divided between four companied - ATE, AEI Henley, STC and Siemens SA ... AEI Henley (later to be taken over by the General Electric Company) and ATE (later to be taken over by Plessey) entered into a 50/50 joint venture, and in 1958 established Telephone Manufacturers of South Africa (TM) to locally manufacture telephone instruments and electromechanical exchange equipment. In 1960, STC began to manufacture transmission equipment and PABXs in Boksburg employing a staff of 200. Siemens opened a factory at Koedoespoort in 1961 which made telephone and

> telegraph exchanges, magneto telephones and later, teleprinters. Plessey, at its factory in Cape Town, began producing items such as cords and manual switchboards for SAPT, Kaplan (1990, p.31)

During the 1960s, output grew and in 1964, for example, constituted about 20% of activity in ISIC 383, Electrical Machinery.[15] The objectives of the first agreement were limited to meeting a local content of 70% and to raise (preferably) white employment. However, local content targets were not met because "local industries were not able to provide some of the key inputs", Kaplan (1990, p.33) although white skill shortages were overcome by employing Indian and Coloured workers. As with the motor industry strategy, no additional supportive strategies were adopted to assist other sectors to build capacity to raise local content. Furthermore, the agreement focused on the internal market only, and therefore precluded the achievement of economies of scale. In 1969, the agreement was renegotiated on the basis of new digital technology which then undermined as outmoded, the achievements made thus far.

The state did attempt to use its purchasing power pro-actively to favour the local engineering industries in the early 1960s. The State Tender Board was instructed by the Minister of Economic Affairs that Government Departments should give priority to the purchase of products of the South African metal industries group. The Minister of Transport instructed the Railways to do the same. The Department of Commerce and Industry set up a Capital Goods Advisory Committee on which Seifsa was represented to investigate possibilities of local manufacture, Seifsa (1966, p.20). However, these were

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[15] Based on Kaplan's figure of R30m per annum and ISIC 381's gross output of R153m in 1964, South African Statistics, (1990).

largely confined to ISIC 381 and, in any case, the state was not the main purchase of output from ISIC 3800.

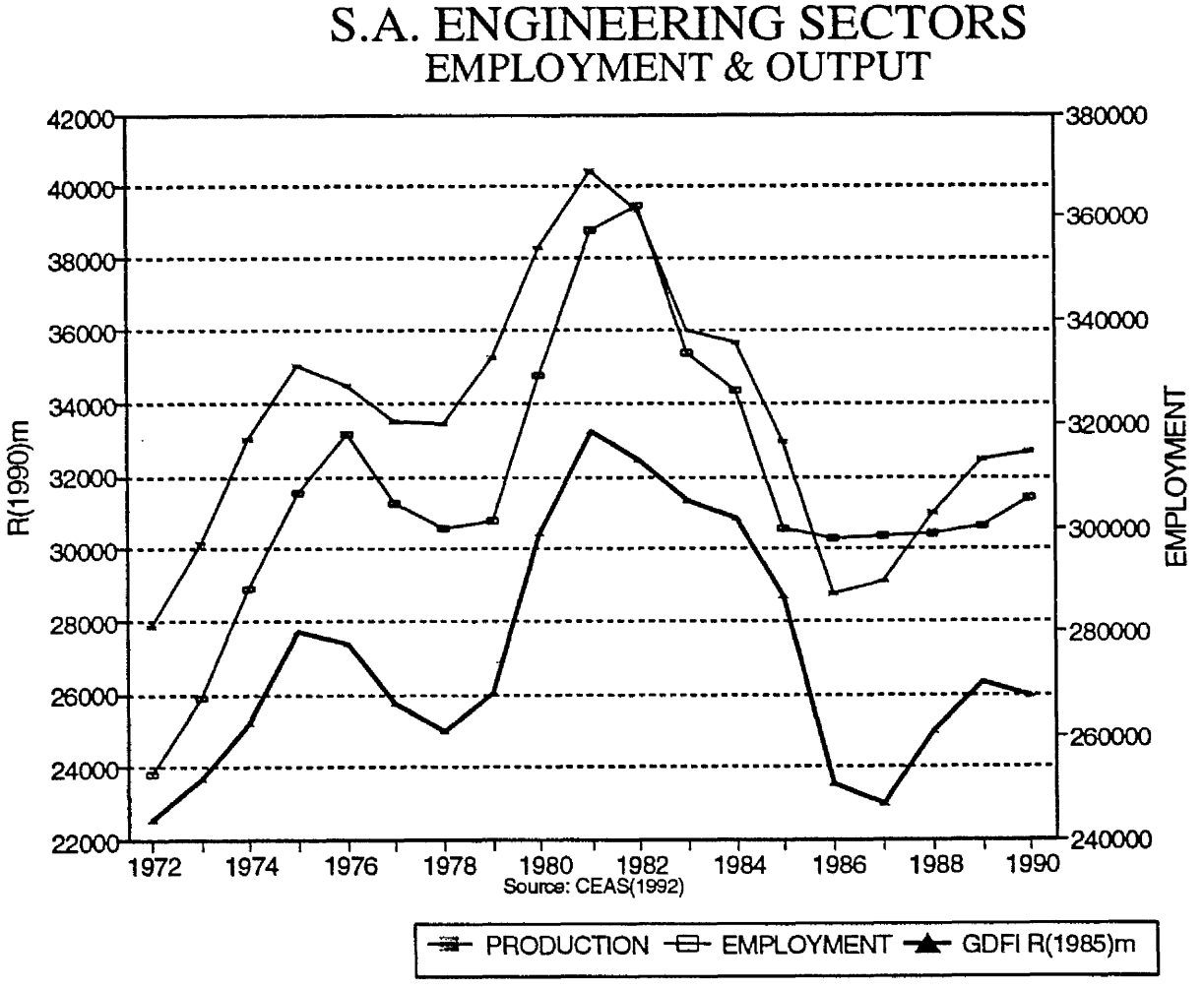
In summary, the decade of the 1960s was characterised by rising investment in MEC core sectors, the increasing interpenetration between English and Afrikaner capital and an increasing concentration of ownership of most sub-sectors of manufacturing including the engineering industry. The influence of Iscor decisions on ISIC 381 diminished as private capital vertically integrated out of its new primary steel production with other downstream acquisitions. But ISIC 381 and other engineering sub-sectors remained tied to the fortunes of the MEC as before. While the state attempted to diversify out of the MEC, particularly by fostering the automotive industry, policies were not cohesive and coherent enough for that sector or for its supporting sub-sectors within engineering.

4. THE ENGINEERING INDUSTRY AND THE MEC - 1972-1990[16]

The rise in gold and energy prices after 1973 led to the expansion of the MEC core sectors together with increasing coordination of activities within it. This concerned, in particular, coordination around energy, coal and chemicals and was accompanied by growing conglomerate control of the economy. These events around the expansion of the MEC core in the 1970s led to corresponding growth and change in the engineering sectors. Engineering output rose from R28b to R40b between 1972 and 1981, a most intensive period of mega-project investment, (figure 6.3). But output contracted in the early 1980s as GDFI fell, resulting in considerable employment loss, and illustrates the dependence of engineering on MEC expenditure. Engineering employed 307,000 of the 1.4m employees in the manufacturing sector in 1990. The Mossgas mega-project boosted engineering in the late 1980s and the recent commitment to Alusaf, Columbus and chemical sector mega-projects will further raise this.

[16] This section relies heavily on work carried out in Rustomjee (1993) for the Industrial Strategy Project.

FIGURE 6.3 - ENGINEERING SECTOR OUTPUT 1970-1990



Source: CEAS (1992).

(1) Engineering sector includes ISIC 3800 but excludes the motor industry.

4.1 TRENDS IN ENGINEERING SECTOR'S TRADE BALANCE[17]

The South African engineering sector has developed in the shadow of the MEC. The changing nature of MEC core sectors has also altered the characteristics of the engineering sectors, both in terms of output range, quantity and quality as well as institutionally, for example, in regard to ownership.

Historically, the sectoral trade balance has fluctuated according to three factors. First, GDFI expenditure has been the primary drive behind imports into the engineering sector, (figure 6.3). This is due to the particular lumpy pattern of investments, namely the commitment of massive amounts of capital to mineral processing, petrochemical and energy (Escom, Sasol and Mossgas) mega-projects. A large proportion of national investment was allocated to the Escom expansions between 1970-1985, to Sasol II and III between 1976-1982 and to Mossgas between 1988-1991. On average in 1990, the import/output ratio of the manufacturing sector was 0.37. The engineering sector's average was 0.56. Mining, in contrast, has a much lower import propensity, estimated to be about 0.05, Chapter 1. Engineering is a conduit for many imports destined for the sites of such projects. Turbines, compressors, vessels, pumps, machinery, components, are all required to be assembled and engineered into the projects. Thus the high import propensity of engineering is partly symptomatic of the fact that investments have focused on the Minerals-Energy Complex, which have required inputs which are import-intensive.

Given that present Government and some extra-parliamentary planners have favoured a continuation of MEC investment to the exclusion of other strategies, the

[17] Unlike IDC (1992), CEAS (1992) trade data excludes BLS and Namibia and has been used as such throughout this study except where indicated.

outlook for the engineering trade balance is bleak. The evidence below tends to negate the argument in the Nedbank Review, May 1992 which held that;

> ..in 1984 when capital formation relative to GDP was high at 25%, ...only 18.6% of all imports are used directly in fixed capital formation[18] ..(and therefore)...although an increase in fixed investment expenditure will result in an increase in imports, the impact may possibly not be as severe as anticipated.

The year 1984 was atypical in that no mega-project was in progress, the economy was sliding into recession, Escom was cutting back on expenditure and engineering lobbies were besieging the Department of Mineral and Energy Affairs to approve one of the several import replacement synthetic fuel projects that were supposed to follow Sasol II.[19] Gencor had proposed a coal liquefaction plant, Caltex and Anglovaal put forward a methanol plant, AECI submitted a coal based methanol-to-fuel project, Sentrachem had proposed producing ethanol from biomass, and Sasol had proposed Sasol IV. The result was Mossgas, much to the disappointment of the conglomerate parents of the engineering groups.

The trade balance has also fluctuated with the business cycle, lagging by approximately one year or less, with upturns and growth tending to suck in imports, and downturns having the opposite effect. This, of course, has serious balance of payment implications for any future periods of growth.

The exchange rate, the third influencing factor, appears not to have had an impact on engineering imports

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[18] Of the balance of 81.4%, 56.1% of imports were used in "intermediate demand". The Nedbank Review, July 1993, wrongly assumes that none of this finds its way into fixed investment, whereas the evidence of this study proves otherwise.

[19] Financial Mail 6-4-84.

as much as other factors discussed above. The Rand was acknowledged to be overvalued, between 1972 and 1982 and, while this may have discouraged the export of engineering outputs, the evidence below is that most engineering sub-sectors were operating at close to capacity and producing for the mega-projects of the time. Depreciation of the Rand after 1985 did not dampen imports into the engineering sector but exports have increased, (figure 6.4). However, other factors, such as the General Export Incentive Scheme (GEIS), the two-tier exchange rate mechanism (see Shipbuilding below) and the need to export or die in declining domestic markets (See Railway Equipment below) have also contributed.

There is considerable variation between sub-sectoral Import/Output (I/O) ratios, (figure 6.5). As expected, the sectors involving machinery manufacture are the most import-intensive, having ratios well above the manufacturing I/O average of 0.37. The trade balances of individual sub-sectors have varied over time and are discussed individually below.

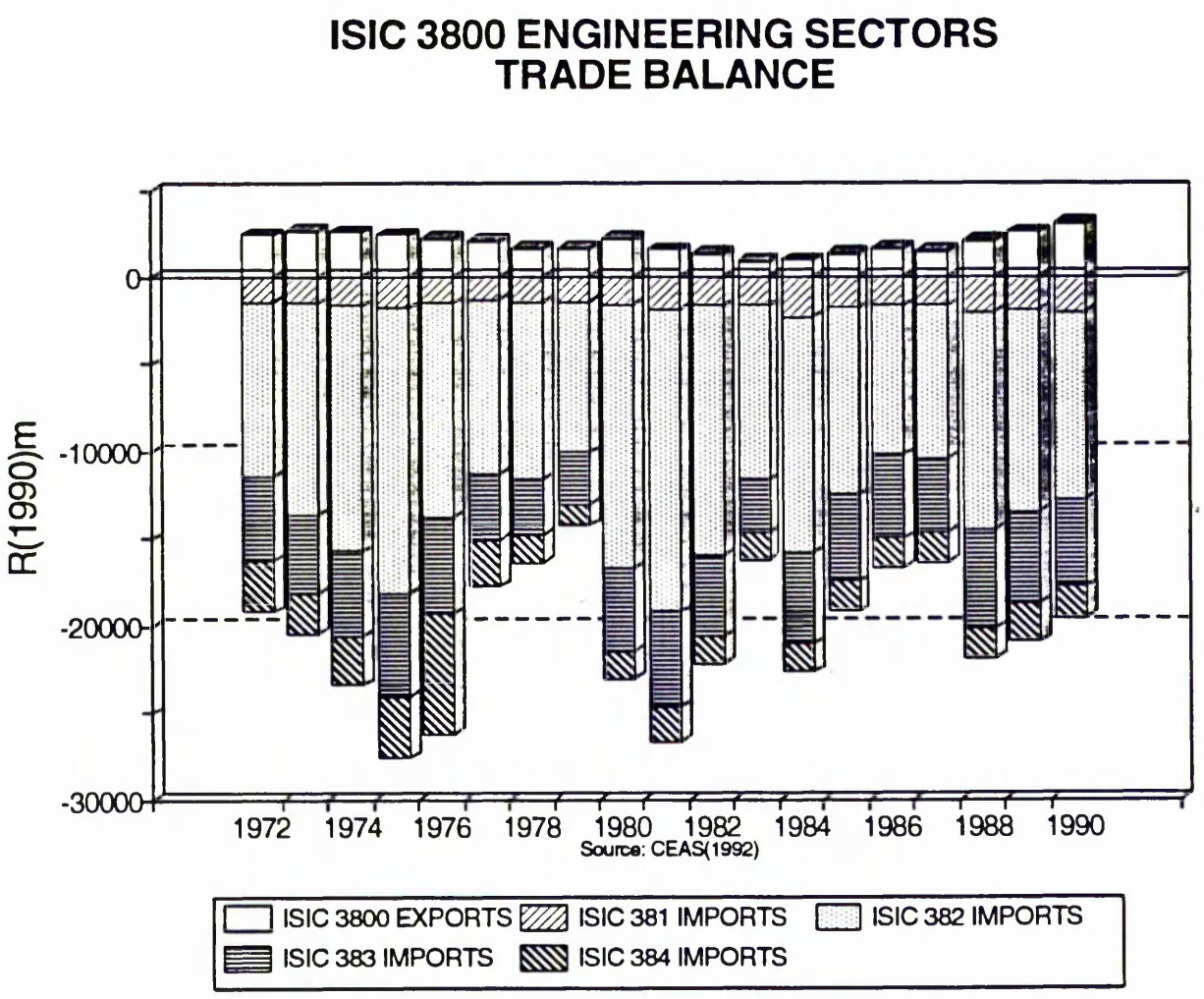
A similar diversity exists in Export/Output (E/O) ratios within engineering, (figure 6.6). The average for engineering is 0.11 and 0.51 for manufacturing as a whole. In 1990, the engineering sub-sectors with the highest E/O ratios were Metal and Woodworking Machinery, Railway Equipment, Other Transport Equipment and Shipbuilding. There is at present no clear evidence of sustainability in these export achievements, Rustomjee (1993). Many industries appear to be feeling their way into export markets, cushioned by GEIS and other incentives. Furthermore, exports are from such a low base, that swings in E/O ratios from year to year are significant enough to make the ratio meaningless. For example, while Metal and Woodworking Machinery production was R245m in 1990, imports were worth R1159m with exports of R140m.

Rising exports have been accompanied by significant ownership concentration, capital intensity, changes in production organisation and rising productivity. The causes and effects are blurred, varying across sub-sectors, but although GEIS and a declining rand exchange rate have assisted, they do not appear to be determining.

While it is true that the capital goods produced from engineering sectors in South Africa exhibit lower export propensities compared to several NICs, this is but one basis of comparison. The simple comparison of export propensities is descriptive, and does not analyse reasons for the path that engineering has followed or why it failed to go beyond import replacement.

One of the consequences of the pattern of engineering growth is that its overall trade balance has been consistently negative, (figure 6.4). Portrayed in this way, the statistics conceal an important determinant in the trajectory of the engineering sector's development, which is that a considerable proportion of engineering sector imports are required for MEC investments, particularly the capital-intensive mega-projects. This reveals the engineering industry to be both a site of value-adding activity as well as a conduit for goods required for investments made in the MEC core. This situation is more accurately reflected in the ratio of imports/value added. The impact of MEC expansion in the 1970s and the Mossgas project of the late 1980s are clearly reflected in rising ratios, (figure 6.7), although the previous trend was downward. Given that the economy is committed to further massive investments in the MEC, it is likely that the engineering industry trade balance will continue to be massively negative.

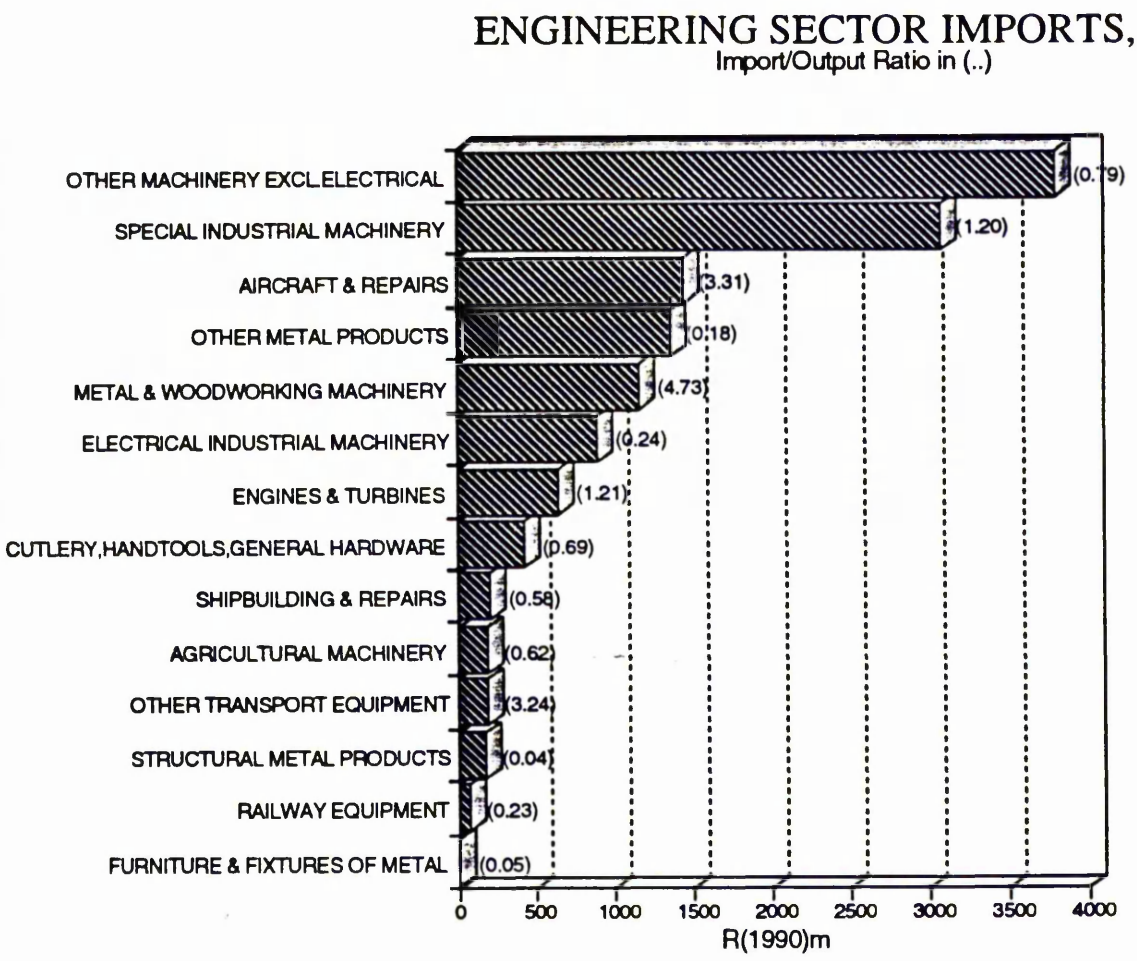
FIGURE 6.4 - ENGINEERING SECTOR TRADE BALANCE



Source: CEAS (1992).

(1) Engineering sector includes ISIC 381-384 but excludes the motor industry.

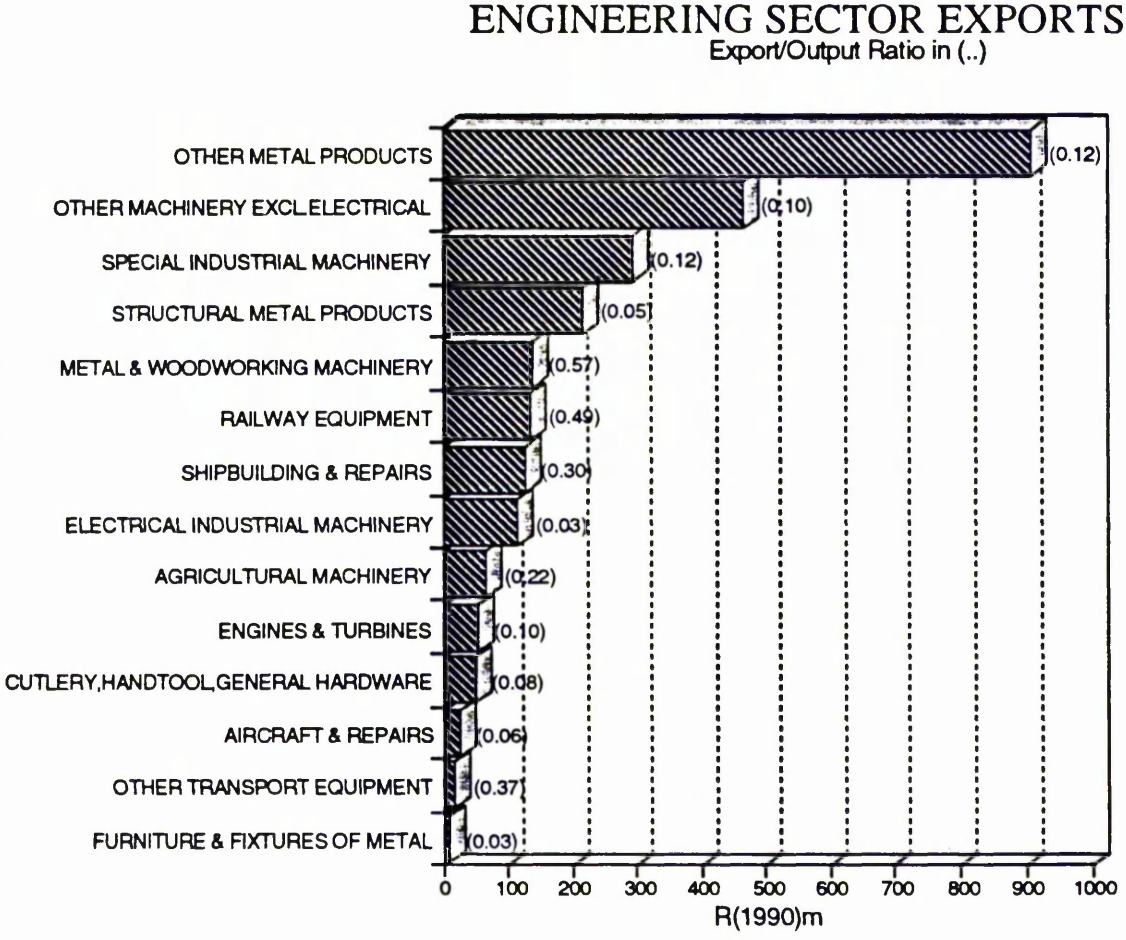
FIGURE 6.5 - ENGINEERING SECTOR IMPORT PROPENSITY



Source: CEAS (1992).

(1) Engineering sector includes ISIC 381-384 but excludes the motor industry.

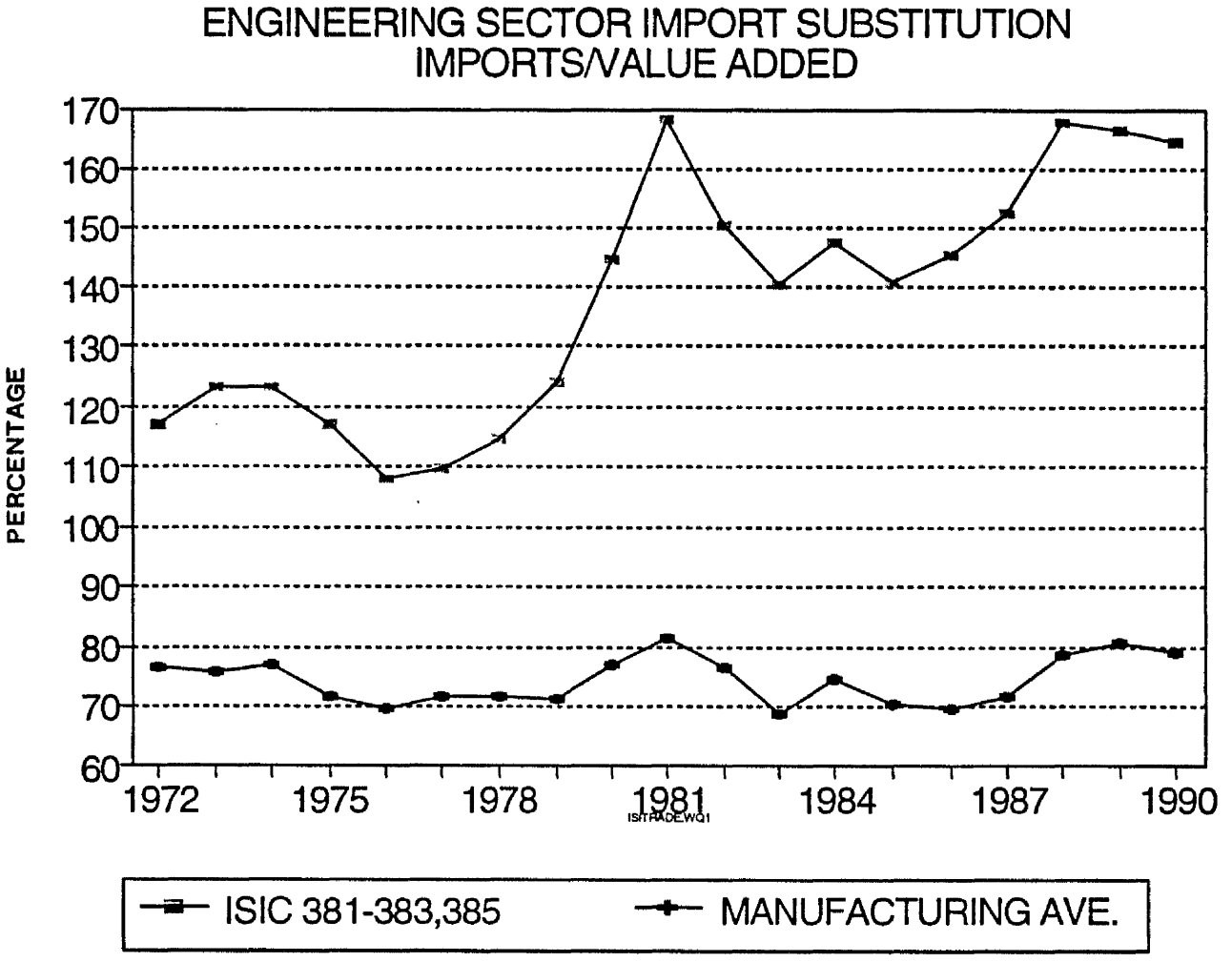
FIGURE 6.6 - ENGINEERING SECTOR EXPORT PROPENSITY



Source: CEAS (1992)

(1) Engineering sector includes ISIC 381-384 but excludes the motor industry.

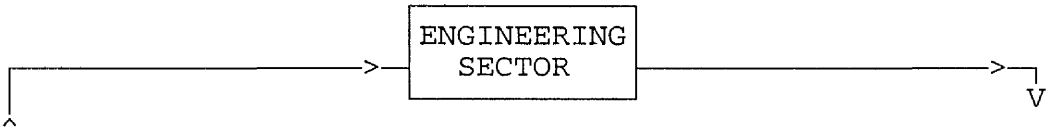
FIGURE 6.7 - ENGINEERING SECTOR IMPORTS/VALUE ADDED 1972-1990



Source: South African Statistics (1990).

(1) Engineering sector includes ISIC 381-384 but excludes the motor industry.

FIGURE 6.8 - ENGINEERING SECTOR LINKS WITH OTHER SECTORS, 1988



% OF TOTAL INPUTS FROM		% OF TOTAL OUTPUTS TO
1988		1988
1%	MINING	16%
35%	MINERAL PROCESSING	4%
9%	ENERGY/CHEMICALS	5%
35%	ENGINEERING	25%
20%	OTHER	50%

Source: Input-Output Tables, (1988).

(1) Engineering sector includes ISIC 381-384 but excludes the motor industry.

4.2 ENGINEERING SECTOR ECONOMY-WIDE LINKAGES, INPUT-OUTPUT ANALYSIS

There are three important interlinkages around engineering activities. Firstly, the engineering sector forms the link between bulk material products such as steel, aluminium and chemicals, on the one hand, and more complex manufactures and final demand, on the other. The present role of engineering in relation to the MEC is illustrated in figure 6.8 which shows that about 50% of engineering output was routed to the MEC (including inter-engineering transfers), while 79% of engineering inputs were sourced from the engineering sectors and the MEC. Some 35% of engineering inputs (excluding labour) are sourced from the mineral processing sectors 3600 and 3700, like Iron and Steel Basic Industries and from Non-Ferrous Metal Basic Industries.

Inter-engineering transfers, for example, includes castings output from the foundry industry (ISIC 381) being routed to the earthmoving equipment industry (ISIC 384), which might also receive electrical equipment inputs from ISIC 383. The capacity of an economy to produce a capital item such as a bulldozer, for example, should therefore be viewed as a systemic process, one which encompasses several distinct manufacturing sub-sectors each producing diverse capital goods and/or components.

Secondly, a considerable proportion of engineering output (25%) is drawn directly into sectors "absorbing" GDFI, mainly those sectors around the minerals-energy complex. In 1988, 45% of engineering inputs were sourced from the MEC. In other years, GDFI expenditure in mineral processing, chemical and energy projects might have been more important whereas, in 1988, output was particularly dependent on the mining industry. Mining was

the most important direct single source of demand from outside the engineering sector. This linkage is important when estimating the cascading effects of the mine closures.

Third, strong intra-sectoral linkages exist within and between the various engineering sub-sectors (Eg. foundry output becoming railway/earthmoving equipment input). Inputs to engineering from various engineering sub-sectors amount to 35% of total material inputs, while 25% of engineering output is routed back to other engineering sub-sectors. Thus, contraction of final demand from mining, leads to several multiple contracting "loops" within engineering. During the contraction of the 1980s, this has resulted in huge retrenchments outlined in figure 6.3.

The main implication is that unless other markets are found to replace falling mining, mineral processing and energy sector demand, the outlook for the engineering sector is rather bleak. Conversely, should final demand rise as a result of new or expanding markets, the strong intra-sectoral linkages within engineering could lead to rapid multiplying "loops" of growth.

TABLE 6.7 - ENGINEERING SECTOR OUTPUT DESTINATION, 1990

	FABRICATED METAL PRODUCTS ISIC 381	NON-ELECTRICAL MACHINERY ISIC 382	ELECTRICAL MACHINERY ISIC 383	NON-MOTOR TRANSPORT EQUIPMENT ISIC 384	ENGINEERING AVERAGE	MANUFACTURING AVERAGE
INTERMEDIATE OUTPUTS	64	31	47	13	44	52
PRIVATE CONSUMPTION EXPENDITURE	1	4	6	8	4	23
GOVERNMENT CONSUMPTION EXPENDITURE	3	7	7	47	8	4
INVESTMENT OUTPUTS	27	53	37	22	39	11
EXPORTS	5	5	3	10	5	10

Source: IDC (1992).

In the 1970s and 1980s, the engineering sector has been shown to be demand driven and heavily dependent on GDFI in and around the MEC. However some engineering sub-sectors are more dependent on intermediate consumption, others on government consumption. On average, the engineering sector's output is split between intermediate goods(43%) and investment goods(40%), (table 6.7). The bulk of output from Fabricated Metal Products(64%) is of an intermediate nature, such as structural steel, wire ropes and foundry castings destined for use in mining equipment or motor industry sub-assemblies. This highlights the generic nature of some sectors of engineering. The high proportion (53%) of Non-Electrical Machinery sectors' output was recorded as being Investment Outputs in 1990. This was probably partly related to the Mossgas project.

4.3 ENGINEERING AND THE BASIC METAL INDUSTRIES

The strength of the specific linkages between the Basic Metal Industries and downstream engineering sectors, reinforces the more general linkages shown above, and is reflected in table 6.8. While the relative shares consumed in downstream industries may vary from year to year, a significant 42% of Basic Iron and Steel output is directly utilised in the engineering sectors. This is likely to be higher if indirect supply via steel merchants, for example, is included. Of the balance, 32% of steel output was exported.

TABLE 6.8 - IRON AND STEEL BASIC INDUSTRY OUTPUT, 1988

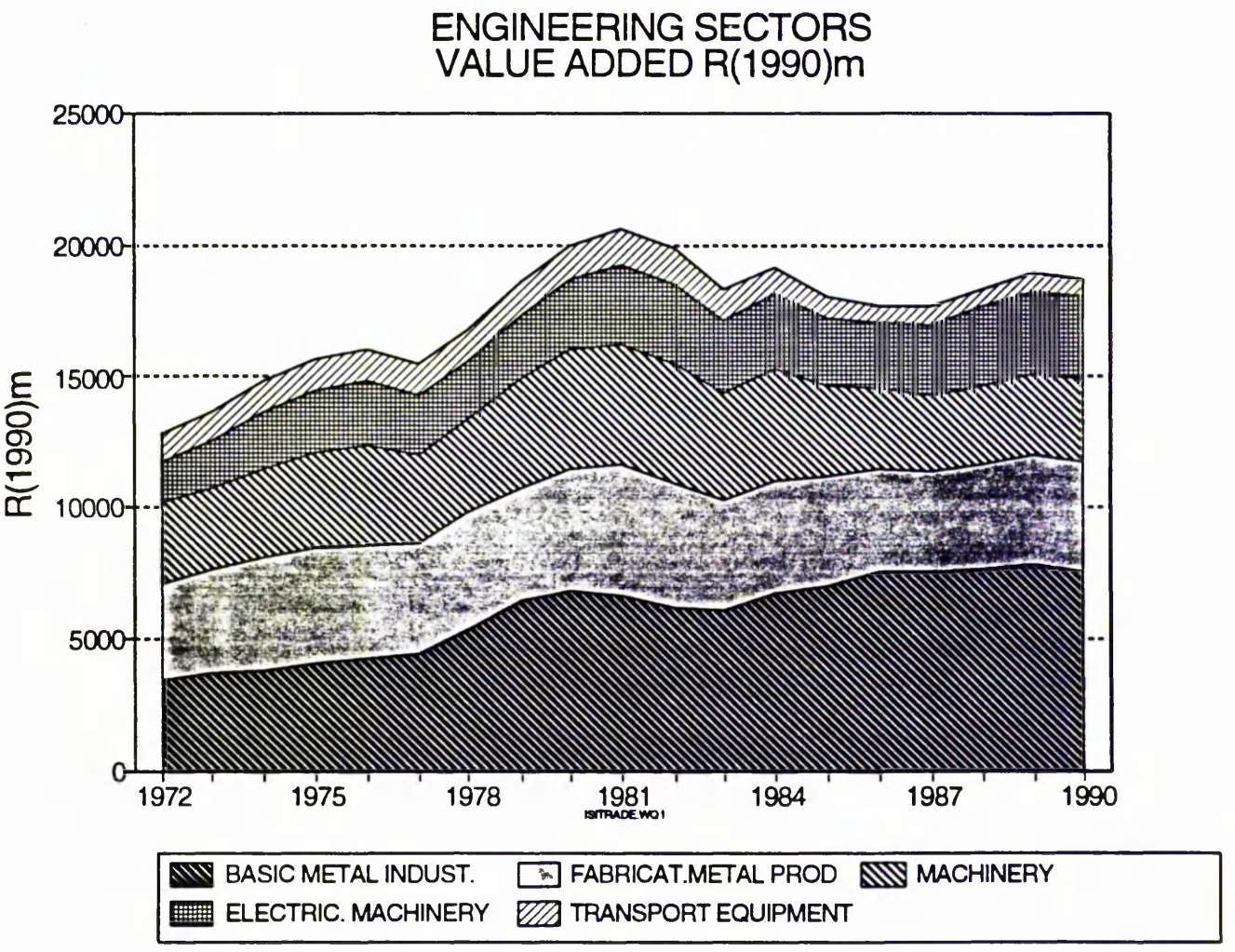
OUTPUT DESTINATION	VALUE Rm.	%
FABRICATED METAL PRODUCTS - OTHER	1,553	13
IRON & STEEL BASIC INDUSTRIES (PIPES & TUBES)	1,466	12
STRUCTURAL METAL PRODUCTS	909	7
CIVIL ENGINEERING AND OTHER CONSTRUCTION	788	6
MOTOR VEHICLES	518	4
MOTOR VEHICLES PARTS & ACCESSORIES	504	4
BUILDING CONSTRUCTION	487	4
OTHER MACHINERY & EQUIPMENT, EXCEPT ELECTRICAL	412	3
SPECIAL INDUSTRIAL MACHINERY AND EQUIPMENT	393	3
ELECTRICAL INDUSTRIAL MACHINERY AND APPARATUS	303	2
OTHER ELECTRICAL APPARATUS AND SUPPLIES	125	1
CUTLERY, HANDTOOLS AND GENERAL HARDWARE	91	1
FURNITURE AND FIXTURES PRIMARILY OF METAL	84	1
TRANSPORT AND STORAGE	82	1
ELECTRICITY, GAS AND STEAM	64	1
RAILWAY EQUIPMENT	58	0
OTHER	590	5
EXPORTS	3,910	32
GROSS OUTPUT	12,337	100

Source: Input-Output Tables, (1988).

Between 1972 and 1990, there was no significant growth in any individual sub-sector, except in the Basic Metal Industry (ISIC 371 and 372) sectors, (figure 6.9). Other than expansion and consolidation around steel production, there were a number of components that made up this growth including ferrochrome, aluminium, heavy mineral sands and platinum.

Basic Metal Industries value added doubled from R3.4b to R7.6b between 1972 and 1990. For the engineering sectors, ISIC 381-384, value added rose to peak in 1981 and fell subsequently with declining MEC investment. There has been considerable variation in value added across engineering sectors and the sections below explore differing trends more fully.

FIGURE 6.9 - ENGINEERING SECTOR, VALUE ADDED 1972-1990



Source: IDC (1992).

(1) Basic Metal Industries covers Basic Iron and Steel (ISIC 371) and Non-Ferrous Metal Products (ISIC 372), which includes include iron, steel, ferrochrome, aluminium, heavy mineral sands refining and platinum.
(2) Transport equipment shown above (ISIC 384) excludes the motor industry

A considerable portion of growth can be allocated to the expansion of Iscor's capacity in Newcastle. Iscor expenditure between 1973 and 1976, figure 4.4 was largely concentrated in expanding the Newcastle Works, which was built partially to support the state's industrial decentralisation plan. It was sited in the Tugela Basin, far from available sources of coking coal and iron ore and far from export ports or steel consuming industries. The decision was taken in 1969 and the first steel poured in 1974. The original population of 10,000 in 1969 was supplemented by 13,000 Iscor workers, and the population rose to 46,000 by 1980. The Newcastle plant's 45,000 tons/month liquid steel production in 1975 rose to 180,000 tons/month by 1980.

Figure 4.4 excludes the estimated expenditure between 1973-76 of R650m on the large MEC Sishen-Saldhana railway project in the 1970s, of which R100m was for mine expansion.[20] This together with other Iscor capital expenditure would have increased demands on other engineering sectors.

Several other industries within ISIC 371 and 372 grew in the 1970s including aluminium, titanium and platinum smelting. Alusaf's capacity was doubled in 1974 and a further expansion was carried out in 1983 by importing an entire mothballed Japanese smelting plant. The titanium smelting operation at Richards Bay was initiated in 1972, as a joint venture between the IDC, Genmin, SA Mutual and QIT of Canada (a subsidiary of mining conglomerate RTZ).

However, the bulk of production was exported and no cohesive industrial strategy emerged to foster downstream engineering use of such output. Instead, existing downstream industries became further integrated

[20] Construction in South Africa, September 1977 estimates of carrying out the Sishen-Saldhana Bay Railway Construction Act of 1973.

vertically into existing primary producers, without diversification out of dependency on the MEC.

4.4 INDUSTRY INTEGRATION AROUND BASIC METAL INDUSTRIES

In the late 1960s, the slump in the steel market led Iscor and Highveld to form a joint venture called International Pipe and Steel Investments (IPSA) in 1971. By 1973, IPSA had rationalised three of the largest steel consuming companies in South Africa, including Stewarts and Lloyds, Vecor and Dorman Long into Dorbyl.[21]

By the 1970s, Afrikaner capital was also confidently reorganising other important sections of the mining and manufacturing industry, although not without favourable assistance from state institutions. Acquisitions of fragmented chrome mines in the early 1970s were consolidated and recapitalised leading to the development of the ferrochrome and ferromanganese industry on a large scale. After embarking on a joint venture with Union Carbide, which led to the construction of the Tubatse Ferrochrome smelter, Genmin took control of its main rival Samancor in 1984 in controversial circumstances. Samancor, formed by a merger between SA Manganese and Amcor in 1975, was controlled by Iscor(39.6%) with AAC as the largest private shareholder and Gencor as a smaller partner (7%). In 1977, both AAC and Genmin bid for Iscor's 40% share but each was blocked by the state. In 1983, Genmin instituted a R120m court case against Iscor on a coal supply contract at the tied Hlobane colliery where Iscor was demanding reductions in supply. To resolve this, in June 1983, Iscor exchanged 50.25% of AMCOR (which controlled its share of Samancor) for Hlobane and 70% control of Dunswart Steel despite the fact that AAC would have paid more for the stake. In June 1984, Samancor bought the remainder of Iscor's share.

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[21] Innes (1984, p.208).

Highveld Steel, owned by AAC, only began to pay out dividends in 1973. The company's growth after its initial investment in 1968 was through acquisition. In 1975 it set up the Ferroveld electrode paste plant jointly with Samancor. A ferromanganese operation was bought from Avesta of Sweden in 1976. Rand Carbide's ferrosilicon and electrodes (paste) operation was purchased in 1978 and steel drum and pailmaker, Rheem, was acquired in 1985. The largest acquisition, that of rival Middleburg Steel and Alloys (MS&A), came in 1991 and was done jointly with Samancor. A significant round of capital expenditure came in 1980, A R110m expansion between 1980-1983 raised production from 850,000 tons/annum to 1.1m tons/annum. R60m was invested in a steckel hot-roll mill in 1982. At the time, Iscor was the only domestic producer of hot strip steel and had excess capacity. Air pollution equipment also cost R45m in 1982. Scaw Metals, also owned by AAC, spent R30m in 1983 on a rolling mill and its next round of capital expenditure was in 1988, involving a R72m pelletising plant, a R25m rotary kiln for its Vantra operation, R60m for a 5th sillicomanganese furnace at Transalloy and an R11m ferrosilicon plant upgrade at Rand Carbide.

In 1971, increasing ownership concentration in the economy led to Thomas Barlow and Sons acquiring Rand Mines, owner of stainless steel and ferrochrome producer MS&A. Expansion followed in 1972 with an Argon-Oxygen-Decarburising (AOD) plant, submerged arc furnaces in 1976 and 1977 and a briquetting plant for chromite fines in the same year. Between 1980 and 1982, a R150m expansion was commissioned including a continuous slab caster, a hot Steckel mill and ancilliary equipment, a cold rolling mill, processing lines and a new melt shop. In 1989, some R260m was spent on a chrome direct reduction plant (CDR) at Middelburg.[22]

[22] Davis Borkum Hare (1991).

In the early 1980s, South African steelmakers began to introduce direct reduction (DR) sponge iron plants due to a shortage of scrap. DR also obviates the need for coking coal, which is limited in South Africa. Instead, the plants used industrial gas produced from Sasol's synthetic fuel/chemicals complex. The plants used German technology and some equipment was imported including the plasma arc heaters and rectifiers. The balance of equipment including transformers were made locally. Union Steel Corporation's (Usco) 250,000 ton/annum DR plant cost R25-30m, compared with Iscor's 600,000 ton plant costing R150m and Scaw's 80,000 ton plant valued at R33m.

In the late 1980s, rationalisation of steel producers continued. Usco got into difficulties after its R20m vanadium plant was delayed, incurring an additional R20m penalty from its vanadium flake supplier, Rhovan. Steel and vanadium prices fell and the domestic market was stagnant. In 1991, Usco sold its steel division including DR units to Iscor for R50m, its steel trading operation was sold to Macsteel for R5m and the vanadium venture was sold to Rhovan for a nominal R1.

Most significantly, Iscor was privatised in 1989 and, by 1993, the largest shareholders included IDC (16.1%), SA Mutual (10.1%) and AAC (13.2% through Standard Bank Nominees). This event was followed in 1991 by Barlow Rand disposing of its holding in stainless steel maker, MS&A, to the AAC/Gencor Columbus joint venture.

The increasing ownership concentration of steel, speciality (stainless) steel, ferroalloys and aluminium, in the hands of AAC and Gencor has implications for the engineering industry in the 1990s, for these constitute major inputs to engineering. One important issue here relates to the pricing of intermediate commodities. In a

recent study, Rustomjee (1993), several engineering firms cited the price and quality of steel as an impediment to their competitiveness with imported finished engineered products. It appears that considerable discretion is exercised in the pricing of intermediate materials. Some purchasers in downstream industries have been able to extract export parity prices. The power to do this seems related both to market power through volume purchases and to transfer pricing within vertically integrated industries under conglomerate ownership. Several exporters had special pricing arrangements with Transnet, overcoming another impediment to competitiveness.

4.5 FABRICATED METAL PRODUCTS, ISIC 381

This sub-sector has been closely associated with the Basic Metals sectors. This historical association has been fused through ownership linkages from the 1930s, in the case of Iscor vertically integrating downstream, to recent times by increasing dominance of two domestic conglomerates. Consequently, the sector has the lowest import propensity within engineering, (figure 6.5). Value added in ISIC 381 grew from R3.7b to R5b between 1972 and 1981 and then fell to R4.2b by 1990, (figure 6.9). This sector is explored by reference to the foundry industry and the vessel fabrication industry.

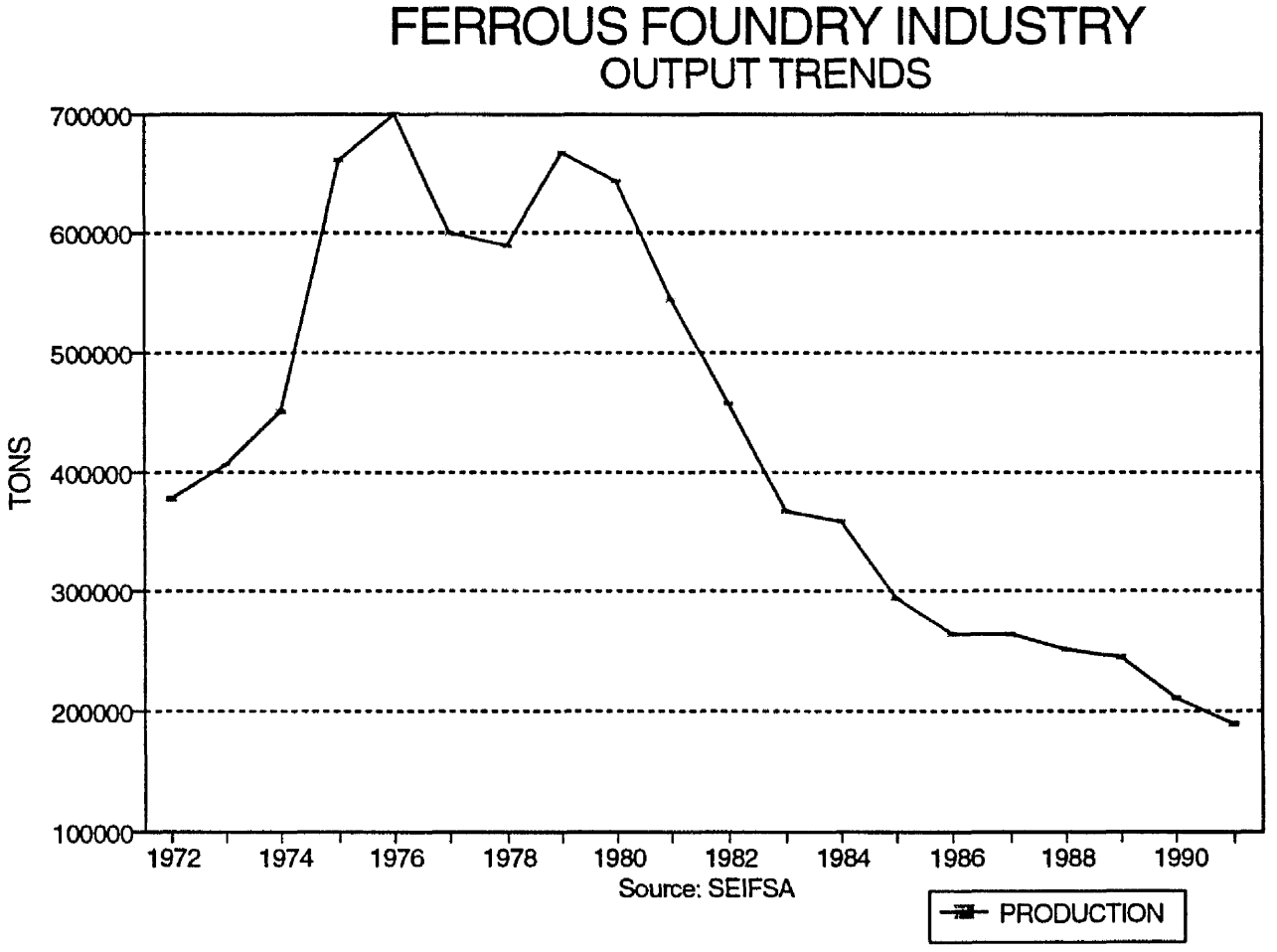
There are close input-output linkages between Basic Metal Industries, ISIC 371 and 372, and the foundry industry. These have overlapped with linkages of common ownership. Metal and energy inputs constitute the bulk of foundry material input costs. As discussed above, the process by which primary steel producers Iscor and Highveld integrated vertically downstream, also consolidated ownership of large foundries. The number of operating foundries has declined from 450 in 1981 to 200 in 1988, Huyl (1988). In addition, concentration of

ownership has increased since the downturn after 1981. The South African Foundry Association, formed in the early 1980s, represents 60 major foundries who produce 70% of industry's output while 20 foundries produced 80% of all exports.[23] In the recession of the 1980s, the process of consolidation has accelerated. In 1991, Scaw acquired the Lennings foundry group. The foundry industry today is dominated by four foundry groups, namely Murray and Roberts Foundries (Gencor), Scaw Metals (AAC), Dorbyl (Iscor and AAC) and independently-owned Unihold. It should be noted that after Iscor's privatisation, Gencor and AAC together control all the main material inputs for foundries.

The foundry industry has been driven, at different times, by demand from various segments of the MEC. Figure 6.10 illustrates the growth in demand for ferrous castings in the 1970s and its subsequent decline. Ferrous foundry activity was associated directly with the SATS railway infrastructure expansion and, indirectly, with infrastructural and capital-intensive mineral and mineral processing projects. The expansion around export coal through Richards Bay increased requirements for coal mining equipment, cast products for the railways and the coal loading terminal. Increased demand for castings came through the Escom power station building programme, Sasol II and III and associated water (mainly pump casings and pipe fittings) projects. The GDFI expenditure decline in the early 1980s is mirrored in a tapering off of demand for ferrous castings from 667,000t in 1979 to 189,000t in 1991.

[23] Engineering News 12-4-90.

FIGURE 6.10 - FERROUS CASTING OUTPUT



Source: Seifsa News.

TABLE 6.9 - FERROUS CASTING MARKETS, 1988

	% BY VALUE
Automotive	22
Wearparts (Mining, etc.)	13
Mining Equipment	10
Pipes & Fittings	10
Pumps & Valves	7
Railway Equipment	7
Building & Construction	5
Electric Equipment (incl.motor)	5
General Engineering	21
	100

Source: Huyl (1988, p.9).

The foundry industry plays an important generic role linking basic metal production with the rest of the engineering industry, whereby 73% of foundry output is routed to other segments of engineering within ISIC 3800, (table 6.9). The industry is segmented between ferrous and non-ferrous products. Firms in the latter segment tend to be smaller and more specialised. The ferrous sector has the largest output in tonnage and value terms and is the largest employer. Non-ferrous sectors tend to be smaller and more specialised. Ferrous foundries are split mainly between heavy and light categories. Trends have differed for each segment and motivating factors have been fairly specific, related largely to changes in the markets for specific foundry products.

While the weight of ferrous casting output declined, the total value of foundry output rose from R690m in 1986 to R1b in 1989.[24] This has been due to a shift to higher value castings of lower weight. Huyl (1988, p.17) shows that the producer price index for castings between 1980 and 1988 lagged behind the indices for base metals, fabricated metal products and transport equipment and,

[24] Huyl (1988).

therefore, rising values and falling tonnages of castings were not simply due to rising casting prices.

As a whole, the foundry industry's expansion in the 1970s and its subsequent decline and consolidation took place in the absence of any industry specific strategy, except where related to arms production. Thus, the opportunities to build and learn on the basis of demand from MEC expenditure have been wasted. In the absence of cohesive industrial policy, the foundry sector's restructuring and contraction has been driven by pure market considerations without regard to preserving and enhancing areas of dynamic comparative advantage.

The heavy ferrous foundry segment expanded during the major infrastructure projects of the 1970s and has declined significantly since then. The closure and dispersion of unique productive facilities like Dorbyl's Vanderbijlpark heavy jobbing foundry in 1993 best illustrates the decline of this segment, with all the ensuing consequences should infrastructural development of major parts of South and Southern Africa take place in the future. Changes in ownership structure, capital intensity and technology utilised by the industry, however, mean that even if infrastructure expenditure meets previous peaks, employment levels will never reach corresponding past levels. In hindsight, it was perhaps inevitable that with domestic heavy MEC infrastructure completed, the need for heavy casting capacity would decline. Had there been a strategy for this sector, such a trend might have been anticipated and instead of prolonging the death of the facility, the dissipated skills and expertise might have been more constructively retrained and rechannelled into one of the growth areas of the foundry sector. The lighter ferrous foundry segments have been adversely affected, firstly, by the decline in infrastructure projects since the early 1980s and more recently, by the decline in mining capital

expenditure and by Phase VI legislation around the automotive industry, its main current market.

The mining industry contraction has severely affected the ferrous foundry industry, though coal mining equipment (largely related to dragline and earthmoving machinery wear parts) demand on foundries have increased. This is a result of the massive increase in capital intensity in coal mining in the 1970s and 1980s, particularly towards open cast methods. The demand for replacement equipment wear parts will continue to keep sections of the foundry industry buoyant. The non-ferrous foundry sector has, in contrast, grown. Motivating factors include technological trends within foundries and trends in the use of lighter materials, mainly aluminium, particularly in the automotive industry.

Significant investments have been made in the aluminium foundry sub-sector, most notable of which is the Murray and Roberts R100m investment in the Cosmar and Gemtec plants in Port Elizabeth. Murray and Roberts are licensed by Cosworth, UK to use the casting process to produce aluminium cylinder heads. The castings will be machined by Gemtec, another Murray and Roberts company using state-of-art technology. Murray and Roberts see their operation as niche-based, having more flexibility in that they can competitively tender for smaller batches that would be ignored by larger overseas competitors.

It is unclear how vulnerable new automotive foundry activity is, linked with the export rebate scheme offered to the motor industry under Phase VI. When the scheme expires in 1996, or earlier if recent evidence of fraud is confirmed, will the bubble collapse as global vehicle manufacturers source their components from countries offering greater financial incentives?

In contrast, an industrial strategy was present for the armaments and atomic energy industries, and a number of specialist foundries developed around the associated large and stable demand. These include Telcast, the Atomic Energy Corporation (AEC), Metallurgical Processes (Metpro) and Castco.[25] Significant capability in producing castings from exotic materials exists in institutions such as the AEC.

The benefits of these achievements have not been utilised to propel the industries concerned to international competitiveness or to diffuse technology to commercial applications. In 1990, the coordination around arms production was summarily scrapped as the state switched to market-oriented policies. The expertise, built up at considerable cost, is presently dissipating through the competitive pressures of a stagnant domestic market, inward orientation and lack of experience in exports and the static competitive disadvantage that exists, in some cases, in competing at international prices. In the absence of an industry strategy, the most likely scenario is that the state-owned facilities or equipment will, in piecemeal fashion, be scrapped or sold to the private sector and associated skills dispersed.

The Mossgas project provided a testing ground for several foundries for petrochemical plant work, which has continued with the Sasol and oil refinery expansions planned between 1991-1994. Metpro, located near the AEC in Magaliesberg, is a leading specialist manufacturer of nickel magnesium alloys and centricast stainless steel tubes. It is one of two South African foundries capable of centrifugally casting stainless steel. The other is Rely Precision Castings, part of the Unihold group.[26] The stainless steel specialist foundry market was estimated at R60-80m in 1990, supplied by only 3-4 specialist

[25] For more detail see Rustomjee (1993).
[26] Engineering News 12-4-90.

foundries.[27] Metpro itself is a subsidiary of Genmin's Impala Platinum Holdings and is effectively a domestic outlet for nickel from the Springs refinery.

Centricast technology is licensed from Post-Marre Edelstahlwerk of Dusseldorf and a lot of Metpro's work has been sourced from the licensor. In 1989, Lurgi placed an emergency order for 200 reformer tube sections for a Shanghai petrochemical plant through licensor PME, which had no capacity at the time. 30 reformer tubes have been made subsequently for Kynoch Fertilisers, Cape Town, (R0.5m) and the biggest contract to date was for 684 tube assemblies and 40 spares for the Mossgas reformers, (R11m). A subsequent R4m export order was obtained for tube ends for 4800 small diameter tubes for an East Asian ethylene plant. Clearly, there is a dependency on the licensor in this particular niche market, but it is important in indicating that requisite quality and price competitiveness is possible in a highly specialised niche. 1990 turnover was about R60m and, flushed with Mossgas success, the company plans to become a world leader in centricast tubes.

The higher value added end of the industry, known as "investment" casting of small net shaped castings, is still rather small. In 1991 there were 8 such foundries in South Africa compared with 200 in Taiwan, which produced 1.2 million tons of castings in 1990, up from 422,000t in 1982.

The strategies adopted by this new "group" type of foundry ownership profess to raise quality through capital equipment upgrading, labour training and export targeting. While there is certainly evidence of rising capital intensity and exports, this has been accompanied

[27] Engineering Week 31-8-90, Steloy Managing Director Danie Slabbert.

by a fall in employment between 1989 and 1993 from 40,000 to 26,200.[28]

A corresponding commitment to raising skills does not appear to be forthcoming. While most of the major foundries are in the process of obtaining the (South African Bureau of Standards) SABS 0157 listing, some doubts have been cast on the effectiveness of raising quality. Anthony Harris, Chair of SAFA and Managing Director of Scaw Metals said "...quality assurance systems seem to generate an enormous amount of paper and provide employment for a new breed of quality assurance engineers. Whether this has made a significant contribution or not I have my doubts..."[29]

In contrast to their overseas counterparts, South African foundries were, in 1990, regarded as largely labour-intensive, with consequent lower productivity and lower quality capabilities.[30] Constraints cited include a shortage of technical and managerial skills and inadequate training facilities, both within the industry and at technikon level.[31]

The South African Institute of Foundrymen (SAIF), a technical organisation promoting technology advancement of casting as a science, appears to be the major protagonists of foundry technology training. Their 1992 focus was on foundry technology and education which is seen as the key to international competitivity. However, most current training is done on a piecemeal basis within a few companies. In 1990, only 50 moulding apprentices and 80 patternmakers were in training in the entire industry of about 40,000 workers.

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28 Engineering News 12-4-90 and Industrial Council Interview.

29 Engineering News 12-4-1991. Several repeated requests for an interview with Scaw's Managing Director were declined.

30 Murray and Roberts Foundries Managing Director, Gordon Scott, interviewed by Engineering News 12-4-90.

31 Engineering News 12-4-90.

4.5.1 VESSEL FABRICATION INDUSTRY

The tank and pressure vessel engineering sub-sector has had a long direct association with the MEC, particularly the mining and chemical sectors. A considerable portion of domestic requirements of chemical sector mega-projects were met by local engineering fabricators. Major linkages exist between the production of bulk steel and aluminium and these downstream activities. For example, of the 3,000t of stainless steel produced in 1992, 300t was consumed directly by container tank manufacturers.

But as with foundries, the potential to build on the enormous demand generated by the MEC core since the 1960s was not realised because of the lack of an industrial strategy for this sub-sector. During the construction of the domestic oil and synthetic fuel industry mega-projects, many fabricators began domestic manufacture but little long term benefit was realised for, once the projects were completed, many of the fabricators simply closed down.

MEC projects tended to source equipment from the home countries of German or UK contractors. Often, this was conditional on the export credit form of industrial financing commonly used. However, some vessel fabricators have been successful domestically. CBI constructors received a Badger order to make 2 vertical coke drums for Sasol's R320m anode and needle coke complex. CBI also received a major portion of the Genref FCCU contract including design, fabrication and erection of a reactor/stripper, regenerator, reactor riser, spent and regenerated catalyst line and it is involved in mechanical package of Caltex refinery octane project and has export contracts of 9,000t including a West African project. It recently relocated its Port Elizabeth plant

to Secunda, which is reported to have the largest rolls in the southern hemisphere.[32]

Another fabricator, DB Thermal, a subsidiary of Deutche Babcock, was awarded some pressure vessel contracts for Sasol's R300m ammonia plant and Genref's R450m upgrade. Design work was done at the Parktown head office and fabrication at the Nigel workshop. This followed a 40 metre distillation tower/column for Mossgas in 1990.[33] Industrial Research and Development of Boksburg, a subsidiary of Afrox/BOC was exporting 40% of production as early as 1980 indicating a degree of competence and competitiveness within South African engineering of fabricated metal products involving a significant amount of welding.

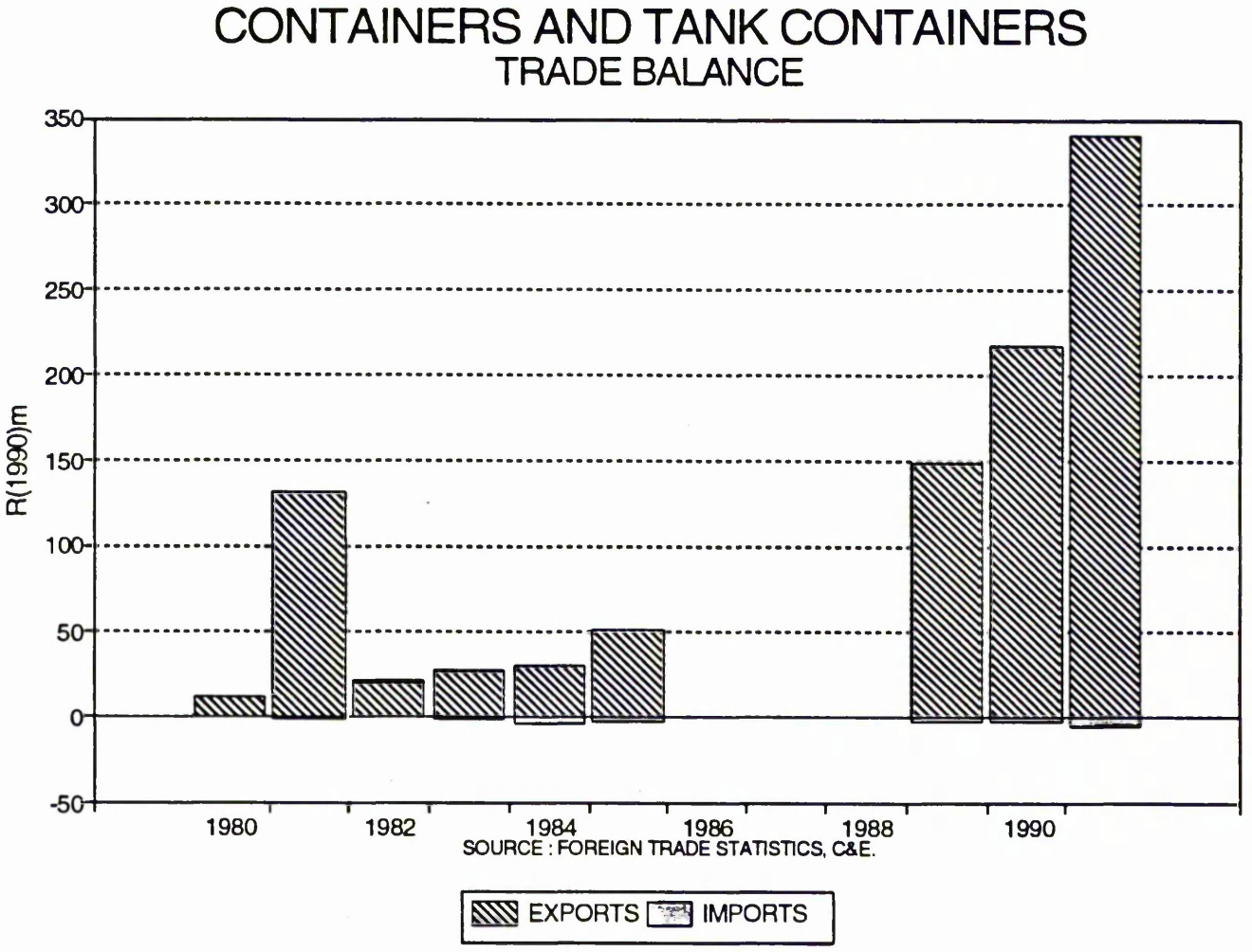
While most of the above are subsidiaries of transnational corporations and therefore more able to access export markets, some indigeneous engineering firms have been successful in producing for the world market. This indicates the possibilites open to domestic engineering. Figure 6.11 shows the rapid growth in exports of container and tank containers. Two companies, Consani(tank containers) and Trencor(containers) are the major manufacturers having raised production on the basis of exports. Export value of tank containers is 60% of the total exports of beneficiated stainless steel and 20% of the world's tank containers are made in South Africa, of which 30% are owned by individual South African investors.[34] [35]

These isolated examples in the context of the broader failure of this sub-sector to develop an independence from the MEC can largely be attributed to

[32] Engineering News 18-10-91. Refers to the size of plate that the mill is capable of rolling.
[33] Engineering News 18-10-91.
[34] Engineering Week 19-2-93.
[35] Tank container leasing came under scrutiny in a 15 month Reserve Bank investigation into a R60m fraud allegedly perpetrated by Multistar Container Transport owner, David Jenkins. The Attorney-General ultimately declined to prosecute. The Citizen, 27-2-93.

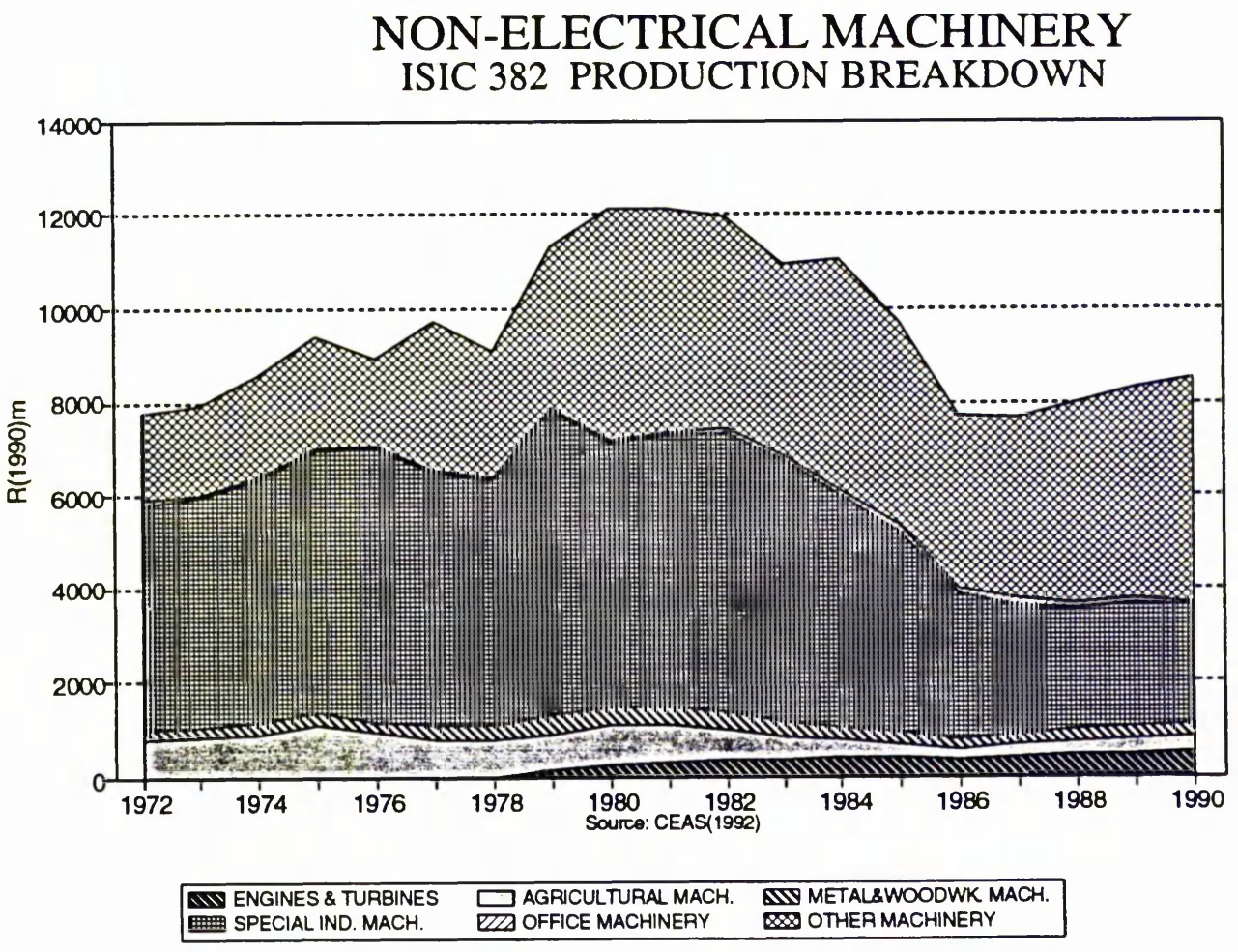
the lack of industrial strategies to take advantage of the large capital-intensive projects of the 1970s. Further examples are given below.

FIGURE 6.11 - CONTAINER AND TANK CONTAINER TRADE BALANCE



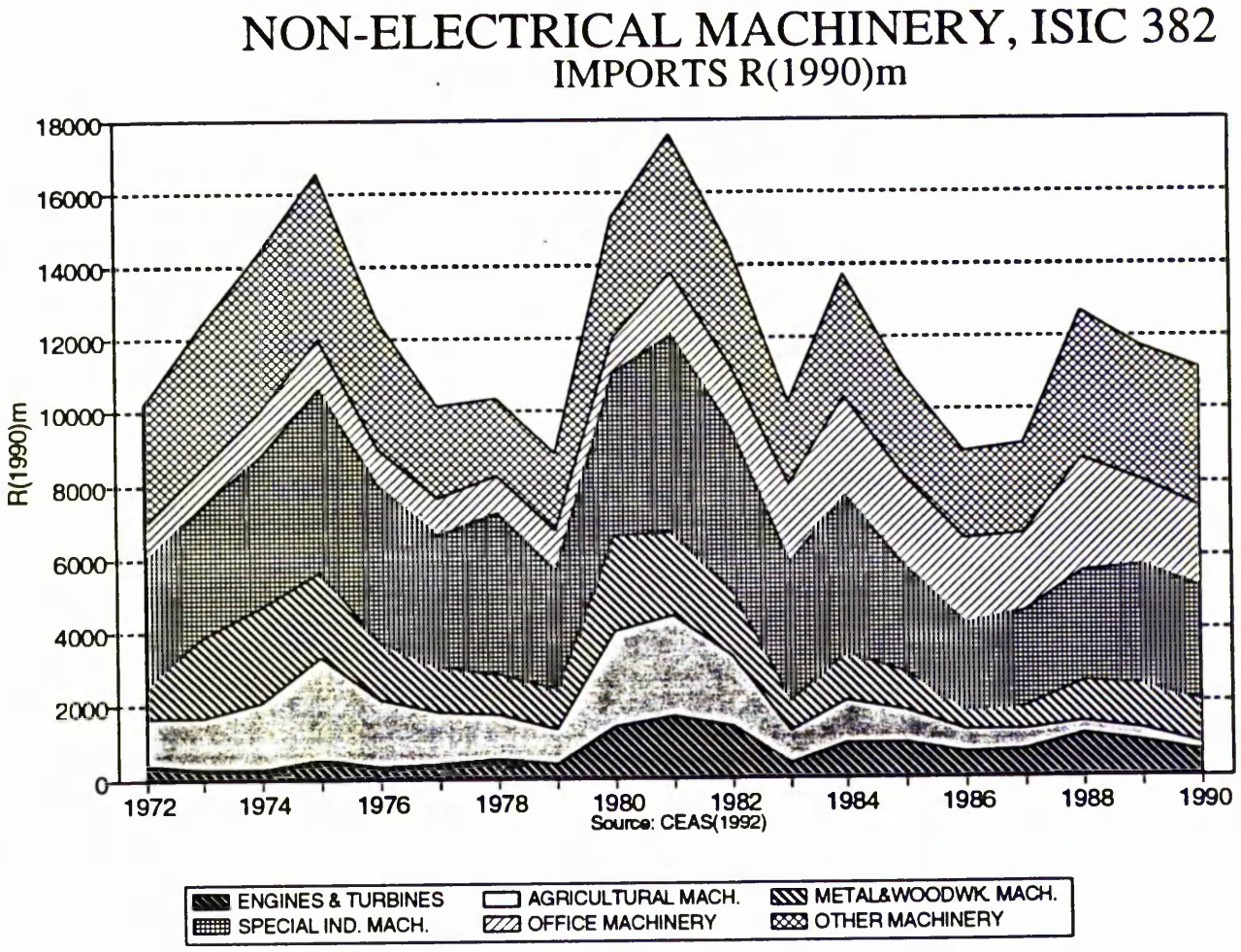
Source: Foreign Trade Statistics, (various years).

FIGURE 6.12 - ISIC 382 NON-ELECTRICAL MACHINERY-PRODUCTION



Source: CEAS (1992)

FIGURE 6.13 - ISIC 382 NON-ELECTRICAL MACHINERY-IMPORTS



Source: CEAS (1992)

4.6 NON-ELECTRICAL MACHINERY, ISIC 382

ISIC 382 has been driven mainly by capital expenditure on mining, mineral processing, petro-chemical and energy mega-projects within the MEC but past decades of expenditure have not resulted in a sustainable and internationally competitive non-electrical machinery sector. The fall in GDFI expenditure after 1981 caused output to contract from R12b to R7.8b by 1985, with employment down from 100,000 to 87,000, (figure 6.12).

There are six main sub-sectors within ISIC 382 producing a sectorally diverse range of machinery. The two largest, in terms of employment, output and imports are, Special Industrial Machinery (ISIC 3824) and "Other" Machinery (ISIC 3829). Both sectors have been driven by MEC expenditure with ISIC 3829 more influenced by arms production.

Special Industrial Machinery includes the manufacture, alteration and repair of food, textile, paper, printing, chemical, oil refining, cement making, clay working, earthmoving, crushing and mineral refining equipment. Other Machinery includes the manufacture and repair of pumps, air and gas compressors, blowers, air-conditioning and ventillation equipment, fire sprinklers, industrial refrigerators and washing machines, mechanical power transmission equipment, cranes, elevators, escalators, industrial trucks, trailers, tractors, agricultural tractors, stackers, sewing machines, small arms, heavy ordinance and artillery assembly, rockets and missile assembly, furnaces, vending machines, industrial dry cleaners, stoves, ovens, ball and roller bearings, piston rings and valves.

Massive MEC capital expenditure after the 1970s contributed to the growth of sectoral output and employment between 1972 and 1982, (figure 6.12). This was

particularly associated with increased mechanisation of coal mining with this and other open cast operations using earthmoving equipment including off-road dump trucks. The rapid growth in employment(+11,000), output(+R2b) and capital stock within Other Machinery between 1978 and 1982 is also likely to have been associated with the Sasol project.

A second factor that supported 1970s activity was growth in military expenditure linked to the invasion of Angola. Unlike almost all other manufacturing sub-sectors, military expenditure sustained output and employment in ISIC 3829 up until 1990. A similar pattern is noted in the Aircraft section below. In contrast, Special Industrial Machinery, ISIC 3824, output collapsed from R6b in 1982 to R2.8b in 1987 with a similar decline in imports and the loss of 10,000 jobs. Four other sub-sectors include Engines and Turbines, Agricultural Machinery, Metal and Woodworking Machinery and Office and Accounting Machinery.

Of note is the decline in Agricultural Machinery imports and production as a result of drought in the 1980s as well as increasing concentration of already capital-intensive agricultural production. The growth of Office Machinery imports (consisting largely of computing and data processing equipment) including automated telling machines is due to rising bank automation. This followed the liberalisation of the financial sector between 1980 and 1983, which led to greater competition on the basis of (imported) machinery.[36]

ISIC 382 has one of the highest import propensities within manufacturing, with output of R8.4 billion matched by direct imports of components and finished products of R11 billion. (Total domestic demand of R19.4 billion) More than half of engineering sector imports of R19.8b

[36] For more details of the liberalisation instruments, see Erosa (1987).

were sucked through ISIC 382, (figure 6.13). Imports have been most significant via the two largest sub-sectors, ISIC 3824 and ISIC 3829, respectively accounting for R3.9b and R3.1b out of ISIC 382's R11b in 1990.

With the exception of armament production, there has been no significant industrial policy targeting the industrial machinery sector. The "total strategy" adopted by the Botha regime resulted in segments of the arms industry being internationally competitive at great cost with few spin-offs to civil industries (discussed separately below). The greatest spin-off was in sub-contracting work, which raised capacity utilisation in several private sector engineering works. This is partly reflected in the buoyant statistics for "Other" Machinery. Sectoral trends are illustrated by reference to the arms industry and earthmoving equipment which includes bulldozers (ISIC 3824), front-end loaders (ISIC 3824) and dump trucks (ISIC 3829).

4.6.1 EARTHMOVING EQUIPMENT

The bulk of the earthmoving sector's material inputs are sourced from other engineering sectors or are imported. For example, about 400 vendors supply equipment to Bell, one of the three main domestic manufacturers. Locally made components include cast axles from Scaw (AAC), brakes from the Southern Brake Co., hydraulic cylinders (made on site) and cast gears, hub reductions, differentials and drive shafts from Paramount engineers. Cast wheel rims are supplied from Guestro Wheels (Dorbyl subsidiary), tapered roller bearings locally manufactured by Timken and steel plate is supplied from Iscor through Stewarts and Lloyds (Dorbyl). Some 15,000t were used in 1988. In 1991, usage had risen to 1,500t/month. The backward linkages with other segments of the engineering sector, such as foundries, are clearly illustrated here.

TABLE 6.10 - 1992 EARTHMOVING SALES BY EQUIPMENT TYPE

NEW WHOLE MACHINES (GENERAL EQUIPMENT)	Rm
SMALL EXCAVATORS	
FRONT END LOADERS	
DOZERS	
TRUCKS-LARGE >150t	
TRUCKS-MEDIUM	
ARTICULATED DUMP TRUCKS(4)	
COAL MINING SPECIFIC EQUIPMENT	
LARGE HYDRAULIC EXCAVATORS	50-100
LOAD HAUL DUMP (LHD) SHUTTLE CARS	39
DRAGLINES	0
CONTINUOUS MINERS	130
TOTAL	1250-1500
SPARES MARKET	750-1500

MARKET SEGMENTATION

	EST. SALES R(1990)	CONSTRUCTION	MINING	GOVT.
1970	R6b	60	10	30
1992	R2-3b	25	70	5

Sources: Interviews with various earthmoving manufacturers, Engineering Week, Engineering News reports. No official market statistics are available for this sector and industries interviewed were very reluctant to release detailed market shares.

Earthmoving equipment itself is quite diverse, (table 6.10). Of the R8b production and R11b imports of ISIC 382 in 1990, new earthmoving equipment accounted for an estimated R1.5b production. In addition, an estimated R1.5b was spent on spare parts by end users.

Earthmoving markets have declined from R6b in 1970 to R3b in 1992. In 1970, heavy infrastructural

expenditure accounted for about 60% of the market but the mechanisation of mining, particularly coal, has made the mining market the most important one in 1992, accounting for 70% of sales. A drag line, for example, would cost about R100m in 1990 and there are currently 28 in service in South Africa, reflecting a replacement value of R2.8b. These forward linkages with mining are significant. Annual expenditure of R2.1b on earthmoving equipment represents about 27% of GDFI in mining (R7.4b in 1990) and 3.7% of 1990 total national GDFI, which is significant for an economy in deep recession, with low levels of capital investment.

The import content of equipment has varied according to type and period. The Barlow Equipment Company (BEM) produces motor graders, wheel loaders, scrapers, off-highway trucks, tractors, coal haulers, water tankers, bulldozers and attachments like blades and rippers. For motor graders, the local content is about 70% by value with engines, transmissions, axles and the hydraulic pump being imported. For wheel loaders, local content is about 60% and even lower for bulldozers. The actual impact on the balance of payments is higher, since half of total market sales consist of spare parts and most moving equipment items are imported. Local content has risen over time. In 1981, estimates were that only 25% of total BEM sales by value were locally manufactured. In 1981, the BEM Managing Director said that it was not cost effective to make many components as this involved tremendous engineering and capital costs. They had not asked for tariff protection because of this.[37] Local component production included buckets and hydraulic cylinders.

[37] Financial Mail 13-2-81.

Declining markets in the 1980s led to the closure of BEM's Nigel plant and consolidation at Boksburg.[38] In addition, subcontracting increased to 50% by value and 75% of individual parts by 1993, raising local content.[39] An estimated 3-4 sub-contracting jobs exist for every Barlow Equipment employee.

In contrast, the local content of Bell's different range of equipment is about 72-78% depending on type of equipment. Imported components include ZF transmissions, ZF transfer gearboxes, Allison transmissions and Vickers(USA) hydraulic pumps.[40] The policy is to standardise on world class component suppliers to facilitate quick response, reliability and security for overseas purchasers.

As with other engineering sectors, increasing ownership concentration within the earthmoving sector has occurred. There are two major domestic manufacturers of general earthmoving machinery, reflecting international competition. Komdresco, (AAC) is a joint venture between Anglo American's Amquip subsidiary, holding the Komatsu franchise for South Africa and Dresser Industries, USA and competes with the Barlow Equipment Company who have had the Caterpillar franchise in South Africa since 1927 with local manufacture since 1951. BEM is controlled by conglomerate Barlow Rand, itself part of the SA Mutual empire. Komdresco 1991 sales are estimated at R500m with Barlows at R600m, each holding about 30% of the estimated total equipment market.[41] Neither company would disclose sales figures in interviews.

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[38]

SALES	Rm	SOURCE
1980	291	(Financial Mail 13-2-81)
1988	103	(Engineering News 26-8-88)
1989	145	(Engineering News 26-8-88)

[39] Source: Interview 9 March 1993. Other sources, Engineering News 26-8-88.

[40] Bell now make an axial piston type hydraulic motor, previously imported from Sweden.

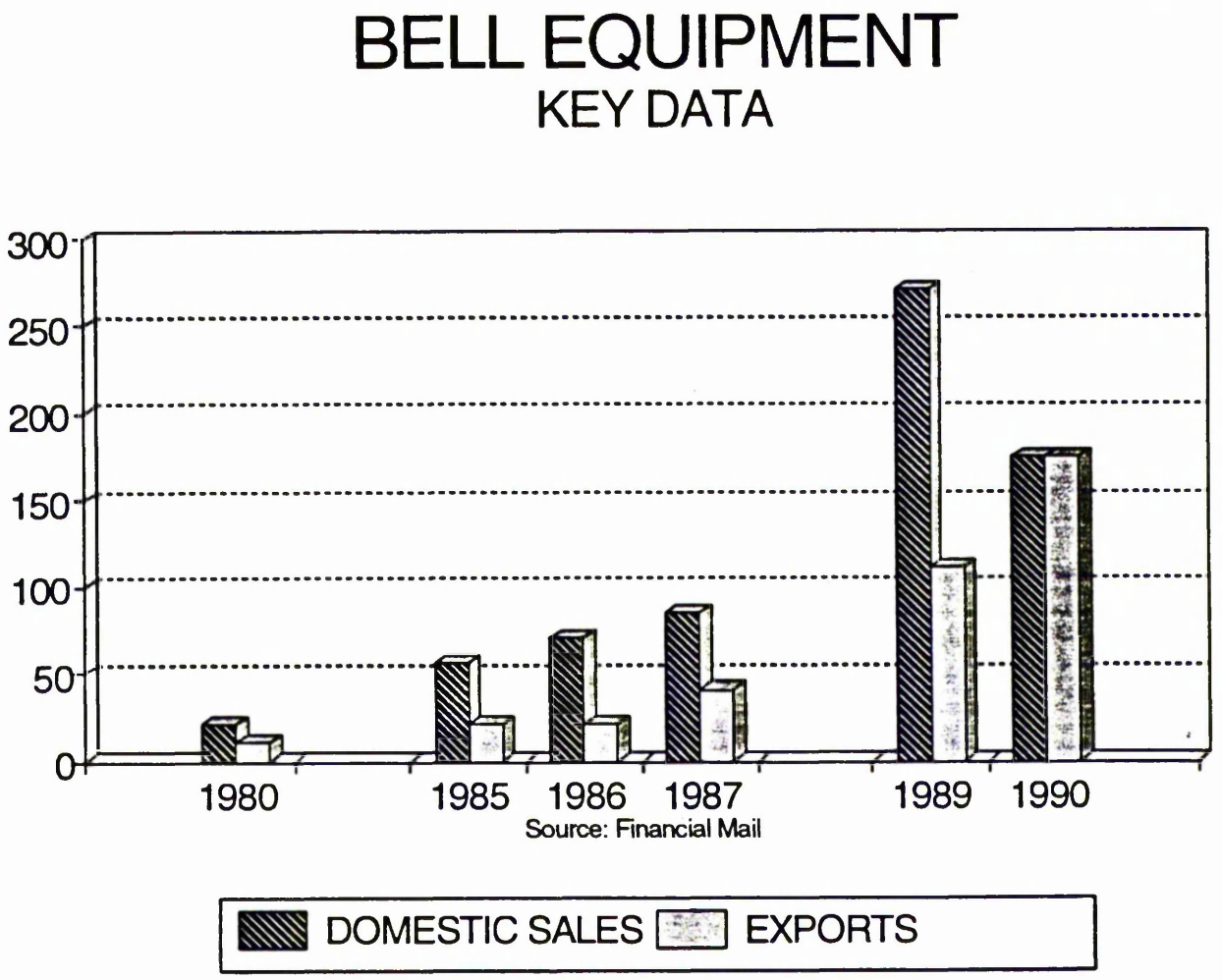
[41] Engineering Week 8-2-91.

Some companies concentrate on certain equipment niches. Bell Equipment Company (family-owned) have been very successful in both the domestic and export market for articulated dump trucks, logging and cane loading equipment. Specialist equipment is made by several other companies. The Joy Manufacturing Company (discussed above) make continuous coal mining machinery. Eimco and Bateman manufacture in a variety of market segments. A number of large international manufacturers such as Harnischfeger, Mannesman Demag, Orenstein and Kopple have local subsidiaries assembling, rather than manufacturing rope excavators and hydraulic shovels. The trend is to import whole machines, with only the buckets and heavy metal fabrication being manufactured domestically. The companies argue that quality is the main impediment to increasing local content.

Many engineering companies who manufacture under licence, including Komdresco and BEM, are geographically limited to domestic markets and are unable to achieve economies of scale by exporting part of their production. Such constraints are negotiable and can be subject to national industrial strategies, particularly given that there is considerable global competition between transnational engineering companies such as Komatsu and Caterpillar.

However, no such industrial strategy has existed in South Africa to develop the earthmoving sector and the magnitude of past markets represent a lost opportunity. The success of the Bell Equipment Company underlines the capability of domestic engineering sectors, as an interlinked whole, to design, develop, market and support a piece of complex machinery in both domestic and international markets. Furthermore, it has done this independently of the domestic conglomerate structure.

FIGURE 6.14 - BELL EQUIPMENT KEY STATISTICS



Source: Interview, Financial Mail 11-10-85, 14-11-86

Bell is a family-owned and -controlled business with Senbank having 10% stake. Having started as a cane-loading equipment company in 1954, it has diversified, achieving phenomenal growth in producing and exporting complex mining and construction earthmoving machinery, (figure 6.14). If its exports are classified under ISIC 382 and not under Transport Equipment, Bell alone accounted for R175m of ISIC 382's R1b exports in 1990.

4.6.2 ARMS PRODUCTION AND THE ENGINEERING INDUSTRY

Unlike most other industrial, particularly engineering sectors, military and ideological factors around apartheid fashioned a very effective industrial strategy to produce and support the production of armaments. This was achieved at an enormous cost of about 1.5-2% of GDP over a period of 20 years. Nuclear power and uranium enrichment was also part of this strategy.

The benefits of this strategy are embodied in Denel, a diversified conglomerate with R3 billion turnover, of which an estimated R1.1 billion relates to mechanical engineering activities. A few internationally competitive weapon systems have emerged within engineering. Commercial spin-offs from military production appear to be limited, niche based and small in value terms. There appear to be few benefits to the internationally uncompetitive enrichment facilities of the Atomic Energy Corporation and the low value of existing and potential spin-offs cannot be justified on the basis of past expenditure. A number of issues pertain to the future though.

A significant proportion of defence equipment production has been sub-contracted to the private sector. Spin-offs from defence expenditure should theoretically have diffused into non-military applications through the firms concerned. There are, however, few examples of

private sector companies that have succeeded in maintaining employment and redeploying efforts in developing such spin-offs from their defence contracts. Instead, reduction in defence purchases have had a significant impact on employment. For every R1b less that is spent on defence equipment, an estimated 20,000 jobs in the engineering sector have been lost, Rustomjee (1993). Significant losses have taken place already.

Commercialisation has reduced any cohesion between Denel, AEC and other state institutions who are under pressure to show short-term paper profits. In the present industrial policy vacuum and ideological and political attacks on the state sector, sales of assets to achieve short term profitability is the most likely route that will be followed. This might not be the optimal use of such facilities in the medium to long term. Alternatively, state-owned engineering industries are entering markets today as competitors rather than as the rich customers they were in the past. While this might raise competition, it is also likely to have a severe and possibly short-term destructive impact on those sectors.

TABLE 6.11 - DENEL PRODUCTIVITY INDICATORS, 1993

	TOTAL PRODUCTION Rm(1993)	FIXED CAPITAL STOCK Rm(1993)	LABOUR	EXPORTS Rm(1993) (3)	IMPORTS Rm(1993) (3)	VALUE ADDED Rm(1993) (3)
DENEL ENGINEERING TOTAL	1,108	228	4,990	308	233.5	556
DENEL TOTAL 1993(1)	3,000	1,900	15,000	675	300	1,350

Source: Rustomjee (1993) based on a Denel interview.

(1)R3,000m turnover includes Denel's intergroup sales of about R500m. Total assets are R2,900m while fixed assets are R1,900m.
(2)Denel "engineering" includes Simera, LIW, Somchem pipemaking, Gerotek, Advena and Gennan.
(3)Figures are Denel estimates for 1993.
(4)1993 GDP estimated at R336b.

Armscor co-ordinated defence force purchases as well as the production of armaments. In 1992 these activities were split, with the latter under Denel. Denel represents a large and diversified conglomerate with significant activity in the engineering sector and some penetration of non-military markets. Denel engineering activities are significant, contributing about 0.2% of GDP. About 37% of total Denel production lies within the engineering sectors, (table 6.11). The balance, which is spread between more traditional weapons production and electronic systems, involves a smaller mechanical engineering content. Of the identified engineering divisions, a significant proportion of activity is associated with aircraft manufacture/repair, small arms, transport equipment and the G5 and G6 artillery systems with a smaller proportion consisting of support activities and non-military sales.

Denel's growth can be attributed to coordinated policies around research, development and production together with the commitment of considerable resources in direct investment. Fixed assets grew in real terms since Armscor was created in 1968 with fixed assets of R(1990)205m. This rose to R(1990)2,118m in 1977 and R(1990)2,373m in 1988. The bulk of fixed investment thus took place in the early and mid-1970s, corresponding to capital stock growth within ISIC 3829, for example. An estimated 1.5-2% of GDP over a period of 15-20 years, was been spent on purchases of arms, contributing to building up the South African arms industry.[42] Guaranteed and coordinated purchases also facilitated investments by private sub-contractors. No other sector of South African manufacturing has received such massive and sustained support, except perhaps the electronics and telecommunications sectors, sections of which were themselves developed to support military applications.[43]

[42] Based on defence budget spending since 1968.
[43] See Kaplan (1990).

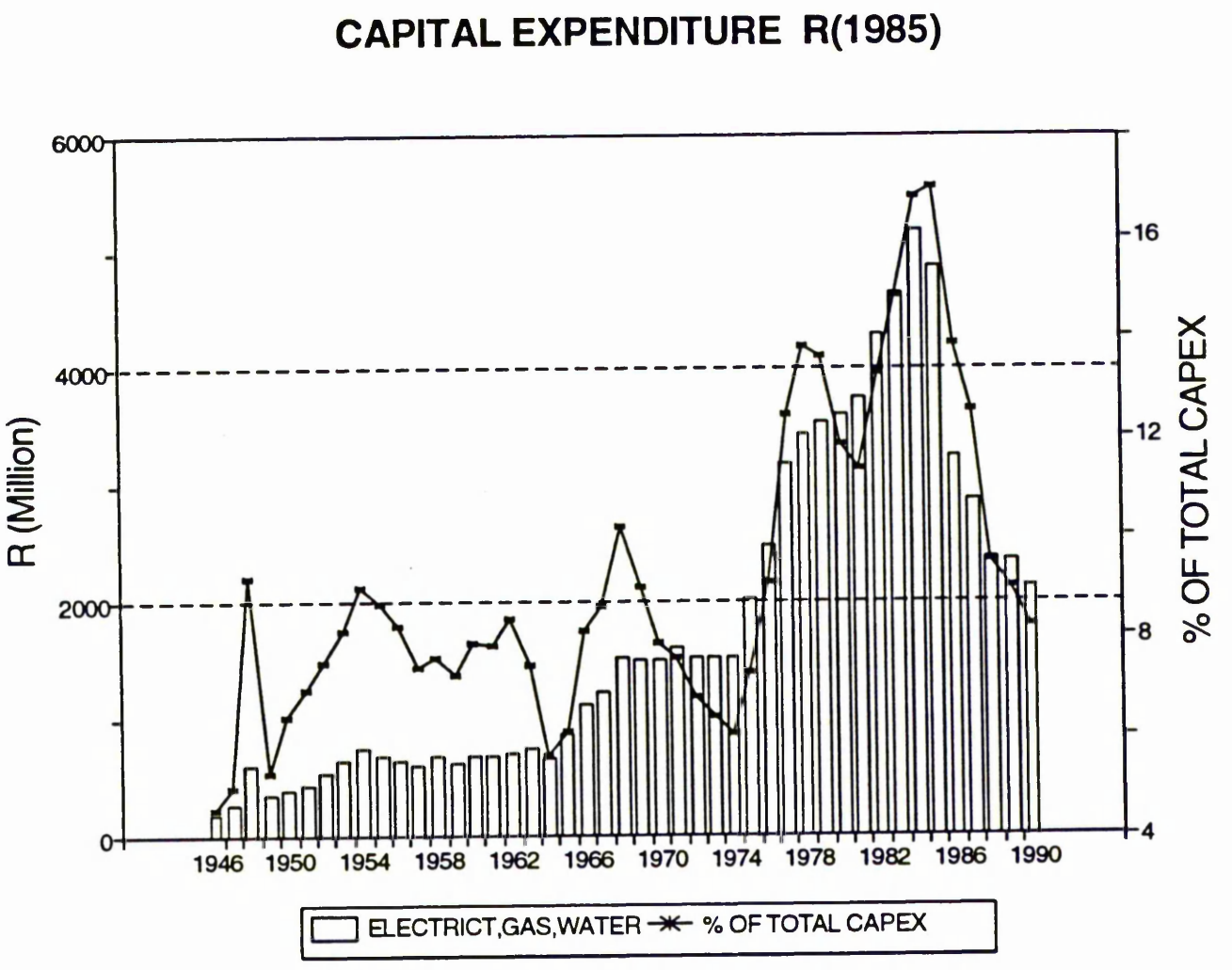
Imports of items used in Denel's 1993 production is about R300m or 10% of output, significantly lower than the manufacturing sector's 37%. However, the import propensity of national armament requirements is significantly higher because the R300m excludes items which are imported directly for use by Armscor, which do not pass through Denel factories. Secondly, the turndown in the defence budget has, for 1993, cancelled or delayed production of some systems which have higher import contents, such as aircraft for example. About 46% of total exports emanate from Denel's mechanical engineering related sectors, mainly G5 and G6 artillery systems. Most exports realise GEIS Category 4 rebates but the company regards itself as internationally competitive without GEIS.

A significant engineering capability exists within the AEC. In the 1970s, the development of the pilot enrichment plant was carried out in secrecy at enormous and, as yet, unquantified cost. It was found that domestic industry did not have the engineering capability to manufacture and test to the high tolerances required for uranium enrichment equipment. Workshops were thus set up at considerable expense at Pelindaba and Valindaba to service the enrichment facility. The AEC received a state subsidy of R685m in 1992 to produce R140m of enriched uranium. The present glut of cut price enriched uranium from the USA and eastern Europe, its availability to South Africa following signature to the Non Proliferation Treaty in 1992 and Escom's commitment to cutting real electricity costs by 20% over 5 years has jeopardised the future of the enrichment facilities. It was recently disclosed that while AEC sells Escom enriched uranium under long term contract at $200/Separative Work Unit, Russia can supply at $68/SWU, resulting in a saving to Escom of R80m/annum.[44] The decision taken in 1993 to

[44] Sunday Times, 21-2-93.

close down the enrichment facilities has led the AEC to diversify (like Denel) into engineering services and other activities and to sell its equipment.

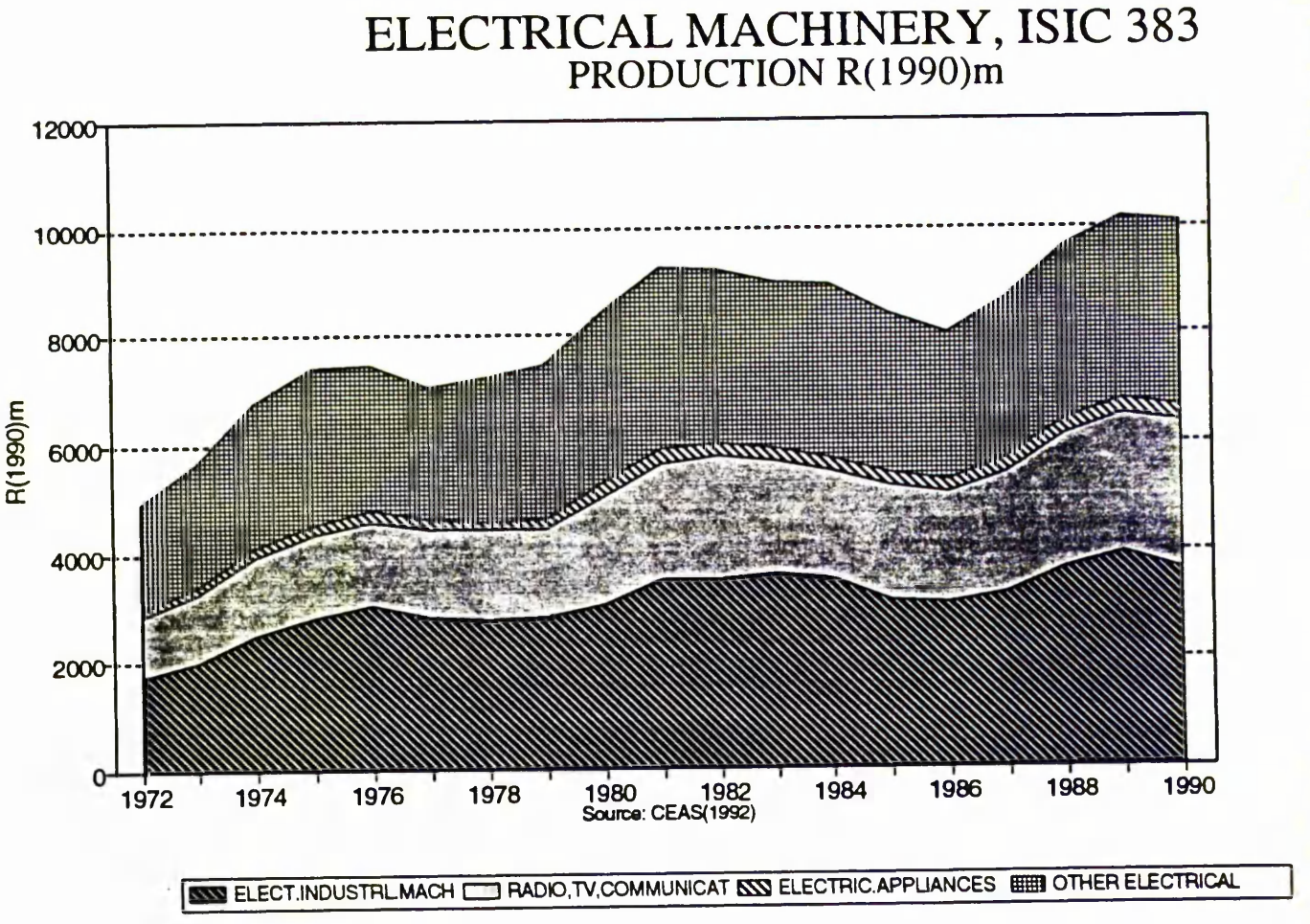
FIGURE 6.15 - GDFI IN ELECTRICITY



Source: South African Statistics (1990)

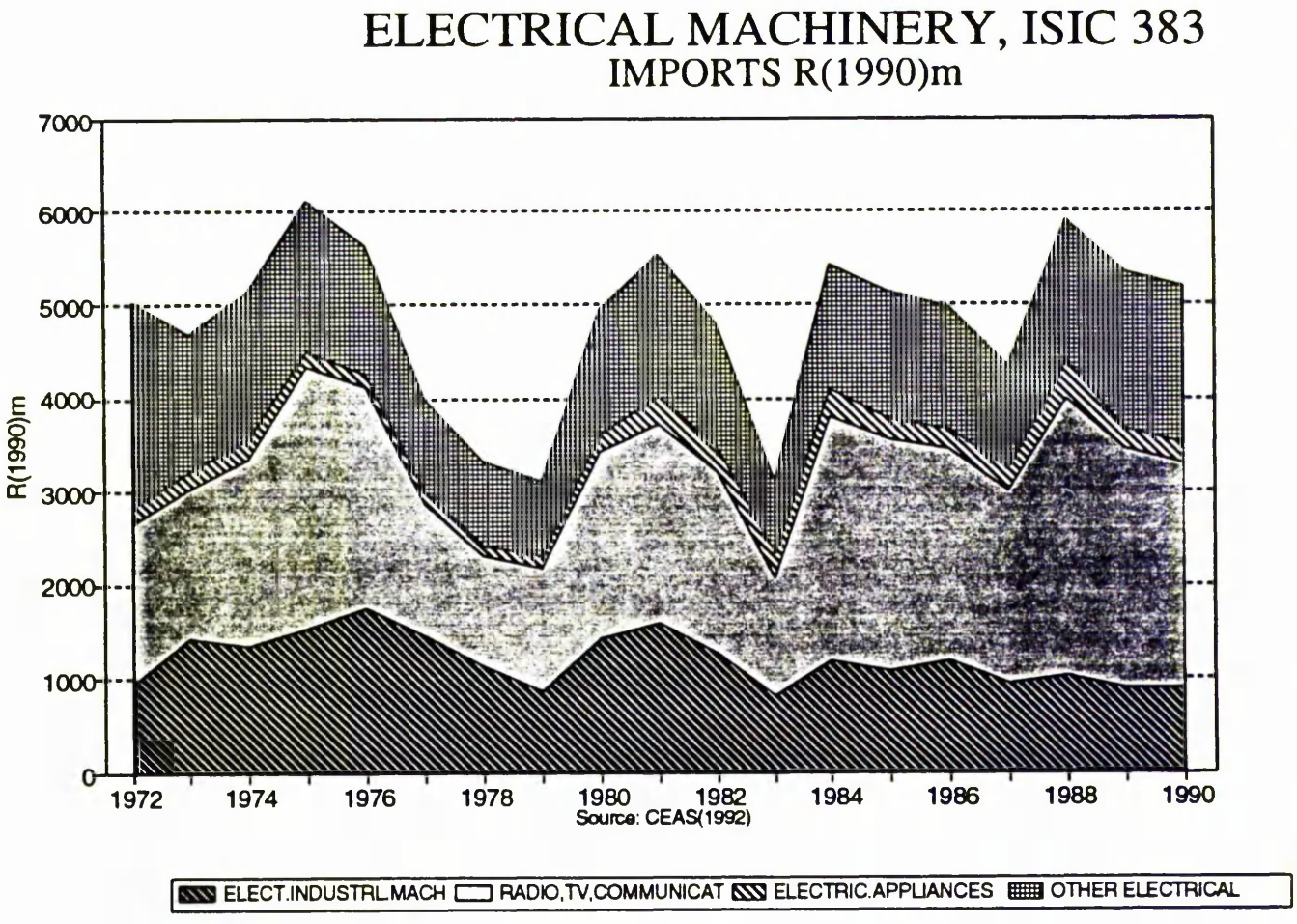
(1) Although the statistics are cited as Electricity, Gas and Water, the bulk of this expenditure after the 1970s was associated with electricity.

FIGURE 6.16 - ISIC 383 ELECTRICAL MACHINERY - PRODUCTION



Source: CEAS (1992)

FIGURE 6.17 - ISIC 383 ELECTRICAL MACHINERY -IMPORTS



Source: CEAS (1992)

4.7 ELECTRICAL MACHINERY, ISIC 383

As with other engineering subsectors, ISIC 383 has also been dependent on investments within the MEC core sectors. This section is not as developed as others since it was not covered in the Rustomjee (1993) study for the ISP project. Electrically operated coal mining machinery, for example, would be produced within this sector. However, Escom's capital expenditure has had the greatest impact.

Major spending programs began in 1974 (R1.5b) and ran through to a peak of R5.2b in 1984, falling steadily to 1990's R2b, (figure 6.15). The latter fall is the result of lower than expected growth in electricity consumption which has prompted Escom to curtail its capital expenditure programme drastically and to mothball older power stations which would also have incurred high maintenance costs to keep running.

There are four main sub-sectors within ISIC 383. The Domestic Electrical Appliance sector is dwarfed by the weight of activities, (figure 6.16), and imports, (figure 6.17), in Electrical Industrial Machinery; Radio, TV and Communication Equipment (mainly South African Post and Telecommunications expenditure) and Other Electrical sectors.

4.8 TRANSPORT EQUIPMENT, ISIC 384

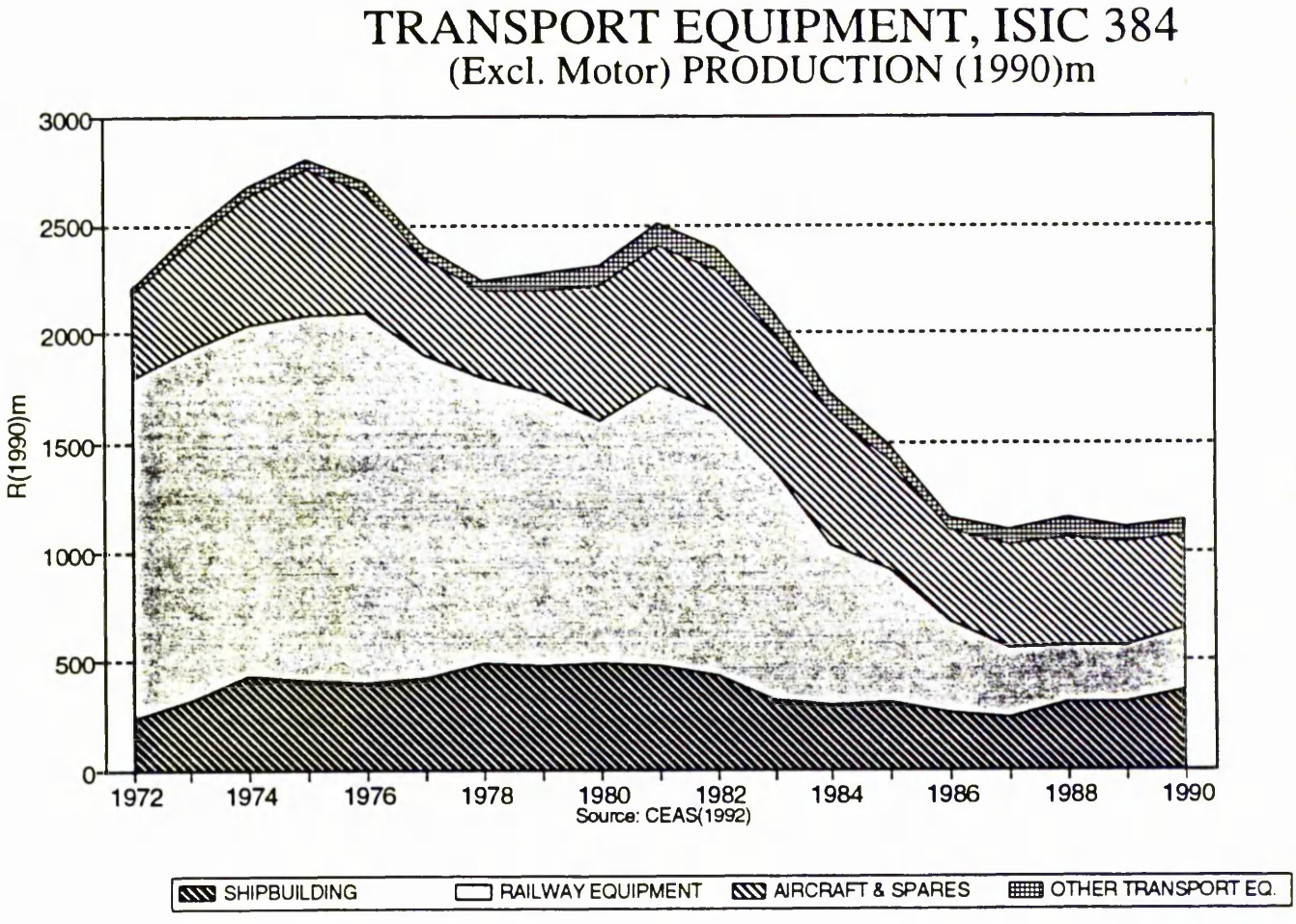
Transport equipment exhibits the same characteristics evidenced in studies of other engineering sectors, namely, dependence on the MEC for inputs and concentrated ownership. Lack of cohesive industrial strategies have led to high import propensities across all transport equipment sub-sectors. The motor industry has been excluded from this study, firstly, because it is

driven less directly by the MEC and more by global factors governing global motor production, even though there are important linkages with other engineering sub-sectors, particularly through the foundry industry. Secondly, it is more researched than other engineering sectors.

Of the four sub-sectors of ISIC 384, Shipbuilding and Railway Equipment have been most influenced by the MEC. Railway Equipment production and associated imports declined drastically in the 1980s on completion of major infrastructure, particularly the upgraded coal export line to Richards Bay. This has accounted for most of the contraction in the sectors' production, (figure 6.18). The Shipbuilding sector is a major market for MEC output. It includes ship repair and activity has been fairly static since the 1970s.

Domestic production of Aircraft and Spares has been associated largely with military aircraft. The import propensity for the sector has been high, (figure 6.5). South African Airways' (SAA) purchases of jumbo jets and South African Air Force (SAAF) requirements in the mid-1970s resulted in ISIC 384's import bill peaking at R7b in 1976, (figure 6.19).

FIGURE 6.18 - ISIC 384 TRANSPORT EQUIPMENT - PRODUCTION

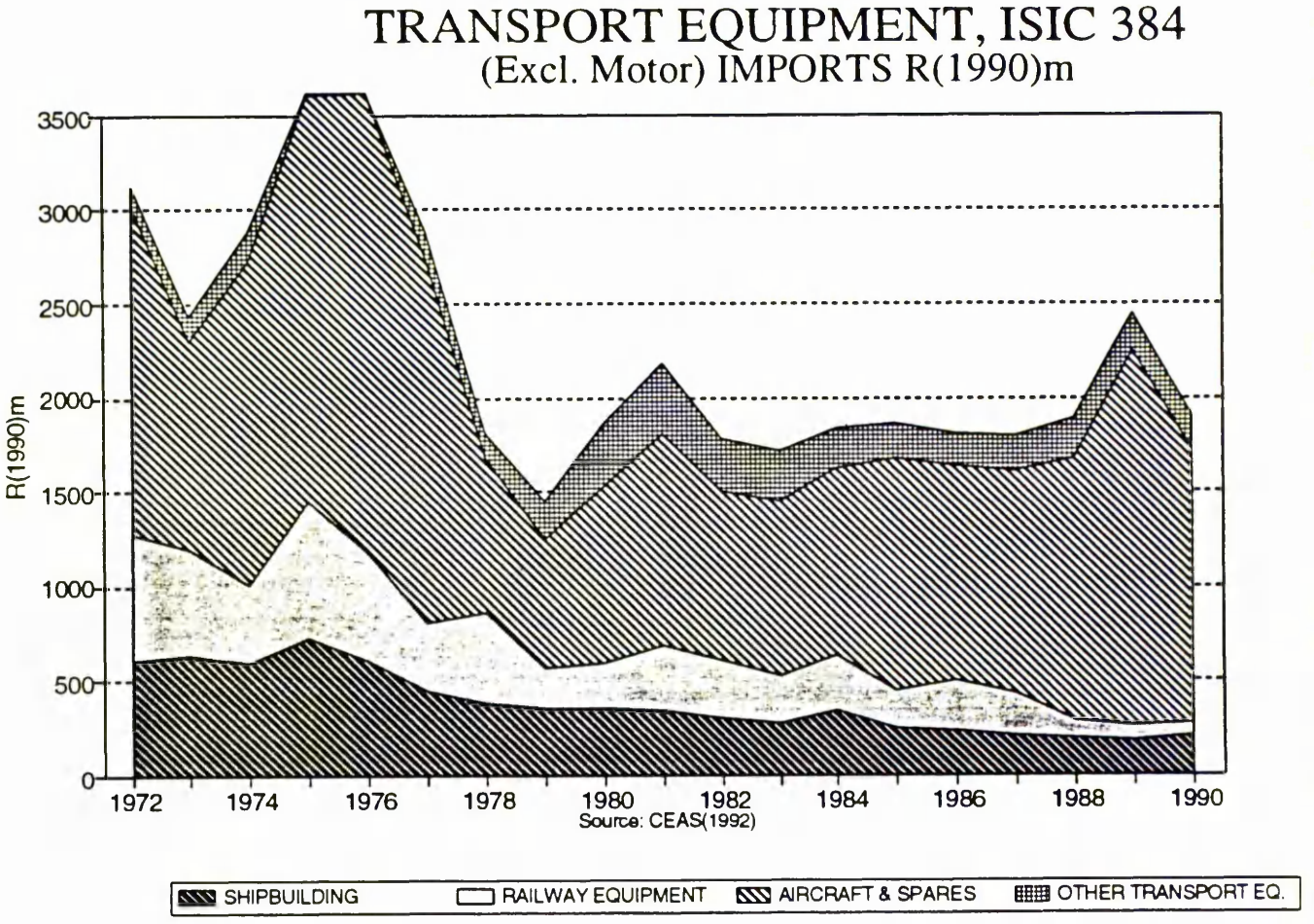


Source: CEAS (1992)

(1) "Other" Transport includes motorcycles, bicycles and scooters.

(2) The motor industry is not included in above statistics.

FIGURE 6.19 - ISIC 384 TRANSPORT EQUIPMENT -IMPORTS



Source: CEAS (1992)

(1) "Other" Transport includes motorcycles, bicycles and scooters.

(2) The motor industry is not included in above statistics.

4.8.1 SHIPBUILDING AND SHIP REPAIR

Shipbuilding is closely linked to the Basic Metal Industries, the source of 21.4% of shipbuilding's material inputs. The chemical industry, part of the MEC, contributes another 10.1% while a further 19.9% of inputs come from within ISIC 3800, (table 6.12).

TABLE 6.12 - SHIPBUILDING AND REPAIR - LINKAGES

ISIC	INPUTS TO SHIPBUILDING FROM	%
3310	Wood	2.3
3521	Paint, varnish, Lacquor	2.8
3529	Other Chemical Products	4.8
351/354	Other Basic Chemicals,Fuel	2.5
3710	Iron & Steel	17.2
3720	Non-Ferrous Metals	4.2
3819	Other Fabricated Metal Products	5.6
3821	Engines & Turbines	3.4
3831	Electrical Industrial Machinery	3.2
3851	Shipbuilding & Repairs	7.7
4100	Electricity	1.9
61/62	Wholesale, Retail, Motor Trade	4.9
7100	Transport & Storage	2.0
81/82	Financial & Insurance Services	3.2
8310	Real Estate	3.1
8320	Business Services	2.5
9900	Other Goods & Services	15.5
Other		13.1
Total Inputs		100.0

Source: Input-Output Tables, (1988).

Given South Africa's location on world shipping lanes, ship repair and, to a lesser extent, ship building, has been carried out for many years, having been boosted during WWII. Shipbuilding and Repair passed through a major cycle of activity from the early 1970s. Closure of the Suez canal led to increasing traffic around the Cape and corresponding repair and maintenance work. Armadah Shipyards exported six oil rigs from the

mid-1970s up to 1983 but failed to secure further orders. The demand for naval vessels during this period, built mostly at the Sandock-Austral yard in Durban also contributed to employment, capital stock and production peaks between 1976 and 1978 which declined thereafter until 1985. After 1985, increased activity was due to the construction of Mossgas offshore modules and with shipping lines, including South Africa's largest, Safmarine, increasing the overhaul of their fleets in South African ports. This was probably related to the collapse in the value of the rand.

Shipbuilding and Repair's trade balance has consistently been negative. This is partly due to the imports of complete vessels. In converting to container trade, Safmarine spent R350m between 1977 and 1980 on importing five 50,000t cellular container ships.[45] In the same period, Dorbyl launched two cellular container ships for Unicorn Lines which, at the time, was the local yard's biggest customer. Local content of recently built vessels was 75% with the main imported items consisting of engines, ancillary equipment, deck cranes and marine electronics. An estimated 70% of components used in ship repair are imported and local manufacture of these items is unlikely in the absence of a viable shipbuilding industry.

Ownership of building and repair operations, as with other engineering sectors, has been vertically integrated with primary steel makers and has, in the 1970s and 1980s undergone increased concentration. Dorman Long established a shipyard in Durban in 1962 based initially on naval contracts. In 1968, it began ship repairs in Cape Town, merging with Swan Hunter. In 1973, Dorman Long merged with Vecor to become Dorbyl. Between 1970 and 1982, Dorbyl Marine launched 57 vessels including tugs, trawlers, supply/service vessels, two oil separator

[45] Sunday Times 7-6-81.

platforms and South Africa's first oil drilling rig. With stagnant demand, Dorbyl's workforce fell from 2,500 in 1983 to 150 in 1985. Withdrawal of subsidies for shipbuilding relegated Dorbyl activities to small vessels for the local market. Dorbyl Marine's survival during those difficult times can also be attributed to the strength of its diversified parent. Dorbyl is owned by International Pipe and Steel Investments SA (52.6%), IPSI in turn owned by AAC 40% and Metcor 60%, while Metcor is owned by Rembrandt 50% and Iscor 26.5%.

By the early 1980s, Dorbyl and Sandock-Austral(Gencor) (naval vessels) were the largest shipbuilders followed by Dorman Long-Swan Hunter. Activity in shipyards declined by 30% between 1981 and 1983, a period of domestic recession and low world demand for shipping. Dorbyl also acquired Sandock-Austral's shipyard in Durban in 1987.

Dorbyl's next most important domestic competitor, EMSO, is part of the Murray and Roberts group (Sanlam). In the 1970s and 1980s EMSO jointly controlled Amardah Shipyards in Durban with Darling and Hodgson, manufacturing oil rigs for export. After 1983, Armadah Shipyards sustained heavy losses and Darling and Hodgson sold out to Murray and Roberts. In the late 1980s EMSO completed the Mossgas jacket and several Mossgas modules.

Conglomerate ownership extends to the ship repair industry. By 1981 the main repair companies were Globe Engineering (Anglovaal), Elgin Engineering (Murray and Roberts) and Dorman Long-Swan Hunter (Dorbyl).

Merchant shipping, also exhibits concentrated ownership. Safmarine was set up by the IDC in the late 1940s with the objective of creating an indigenous merchant marine. Its growth was supported by parastatal contracts such as Iscor's control of Amcor's pig iron

exports to Yawata Iron and Steel in the 1960s, the Iscor Saldhana bulk contract in the 1970s and various fruit export contracts.[46] In 1984, following the sale of IDC shares in Safmarine, control passed to SA Mutual which proceeded to rationalise its freight operations, Safmarine, Freight Services and Rennies into Safren.[47]

Unicorn, South Africa's second biggest line, was formed in 1966 by the merger of three lines and is jointly owned by Safmarine (40%) and Grindrod (60%), the latter owned by Gencor 49% and the Grindrod family 51%. It would appear that some agreement exists to rationalise the market. The Financial Mail, 3-6-83:19 reported that "Safmarine and Unicorn have carved up the globe so that there is no over-lapping of routes".

The domestic deep-sea fishing fleet is controlled by Anglovaal but ownership of the inshore fleet, with the exception of Oceana (Barlow Rand), is fragmented but in need of replacement. It is likely to be a large potential market if standardised patterns were adopted. In 1992, Dorbyl estimated that replacing the 2-300 vessel fleet over the next ten years would cost between R1b and R6b.

Industrial policy did support shipbuilding in the past but did not go far enough, support being limited to raising the consumption of steel rather than developing greater integration with other sub-sectors within and outside engineering. Between 1969 and 1985, shipbuilding was supported by state incentives of a 10% cash subsidy of the contract price for smaller vessels and 25% cash subsidy for larger vessels. In addition a range of export incentives and IDC purchase loans were offered. Local shipbuilders argued that their competitors overseas received far higher subsidies of up to 40% from their governments.[48] In 1985, following a BTI investigation

[46] By 1970, Safmarine had diversified into air transport.
[47] Business Day 24-6-85.
[48] Financial Mail 17-7-81.

into the feasibility of more incentives to stimulate shipbuilding and repairs, the government withdrew the cash subsidies to the shipbuilding industry. This was partly driven by the crisis following the debt moratorium. On the other hand, shipbuilders themselves have not made any significant new capital investment since 1976, an indication of the extent of comfort offered by the above incentives.

Another component of policy towards shipbuilding has been notably absent. South African merchant shipping, despite having been started as a state enterprise, has not been encouraged to support domestic shipbuilding. The fact that the merchant fleet is small, disguises another related problem. For Unicorn and Safmarine, South Africa's biggest shipping lines, have failed to dominate South African freight business, transporting only 14% or 11.4mt of the 110mt handled by Portnet in 1989. (80mt was of a bulk product nature, mainly coal, mined and processed by one or other sister company of Unicorn or Safmarine) The total value of the national sea freight bill was R8.4b in 1989, excluding oil and other classified products. South African shippers captured only 14-17% of the foreign freight bill, reflected as the net payments for freight and merchandise insurance of R2.6b (excess of payments over receipts)in 1989.[49] This was a significant portion of invisible current account item "Service and Transfer payments" of R10.9b in 1989. Had a greater share of national freight business been obtained, the larger purchasing power of domestic shipping lines might have provided greater support to shipbuilding, as was the case in Japan and Korea.[50]

In the past, Unicorn have purchased ships locally while Safmarine have not, partly because the required vessels were too large for local slipways. Recently, five

[49] Financial Mail 24-5-91.
[50] For a comprehensive account see Amsden (1989).

new vessels have been ordered from eastern European yards.[51] Domestic shipping lines argue that high subsidies provided to these yards, which were expected to be phased out in the near future, made local shipbuilders uncompetitive.[52] Furthermore, no local facilities and expertise exist to build the larger vessels.

Of course, developing domestic shipbuilding is not an objective of domestic shipping lines, who are following global shipping market trends and towards integrated transport services, going beyond port-port transfer and paperless shipping through advances in documentation technology. In 1991, Safmarine purchased 49% of the largest shipping container line in Belgium, Compagnie Maritime Belge Transport (CMBT) for $25m. CMBT controls 24 liners, moved 400,000 containers in 1990, (East and west African coasts and controls the AMI forwarding and distribution agency in Africa) and has a large trucking business in Belgium and a freight agency. Unicorn Shipping Holdings has also expanded its presence in European shipping trade routes. Having created two Geneva based companies in May 1991,[53] it sold two container ships (built by Dorbyl in the 1980s) to Carrybox Lines, Switzerland and then bought 80% of Carrybox in a R30m deal and one way of bypassing exchange control. This gives it access to routes between the UK, Europe and Portugal.[54]

Poor coordination and improvement of state-owned dry-dock and repair facilities have also acted against the shipbuilding industry. Some attempts to address this were rejected by the private sector in 1980, when SATS (now Portnet) offered to sell or lease its dry-docks to the marine engineering industry on condition that SATS vessels would get repair priority. They were refused and

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51 Sunday Times 5-4-92.
52 Financial Mail 24-5-91.
53 Financial Mail 24-5-91.
54 Business Day 17-5-91.

no significant investment has been made in facilities since then.

The main constraints to increasing repair work is that ship repair facilities require expansion to cope with increasing traffic and larger vessels. Only one repair wharf in Cape Town was reported to be equipped with a crane, electric power and other facilities. Many wharves do not have power or fresh water.[55] The 250,000t oil tanker, Alborz, spent R1.5m on temporary repairs in May 1991 before sailing to Singapore as no local drydock could accommodate the vessel for essential and lucrative repairs. The world's largest ship, 567,793t Norwegian tanker Jahre Viking, built in Japan in 1979 for Chinese tycoon CY Tung was rehabilitated after Iran/Iraq war damage at a cost of $38m in Singapore. The Cape Town drydock, one of the world's largest, is 25m too narrow to take the ship and no domestic harbour is capable of accommodating wide berth VLCCs. With the present commercialisation pressure on Portnet, and, in the absence of any cohesive industrial policy from the present government, it is unlikely that further investment in repair facilities will be forthcoming.

Overall, freight trends have shifted from general cargo to containerised and to specialised cargos through dedicated private sector leased facilities, eg. Durban's granite terminal, Rennies bulk terminal, SA Sugar terminal, citrus terminal, bulk facilities for molasses, soda ash and coal. It is likely that, given that there are only two major national ships repairers, such trends might extend to dedicated drydock and repair facilities. The possibility of the sale of Portnet facilities raises policy questions around ownership.

In 1990, despite these problems, Dorbyl Marine was awarded a R300m contract for three 10,000dwt container

[55] Financial Mail 17-11-89.

ships for Cyprus based Columbia Shipping. A measure of Dorbyl Marine's dominance of this sector is its 1990 turnover of R299m, 83% of the sector's overall production of some R360m. The Columbia contract was secured by innovative financial engineering which utilised the financial rand. Essentially Columbia invested in local securities under the financial rand and used the dividends to pay Dorbyl. In addition, Dorbyl received GEIS export incentives of 19.5%.[56] In 1992 the Reserve Bank refused to allow Columbia to finance two more ships under such a scheme on the grounds that "SA resources were paying for the ships...(and it)...reviews each proposed scheme on its merits and it tries to be scrupulously fair between economic sectors. Similar schemes have been rejected from other sectors", although it had allowed a certain number of such schemes following the debt moratorium in 1985.[57]

The financial rand issue highlights a potential problem of conflicting policy instruments. While the state's industrial policy had explicitly withdrawn subsidies to shipbuilding, the sector was able to use the exchange control mechanism to increase its international competitiveness artificially. Similar independent operation of the Reserve Bank might in future undermine industrial policy.

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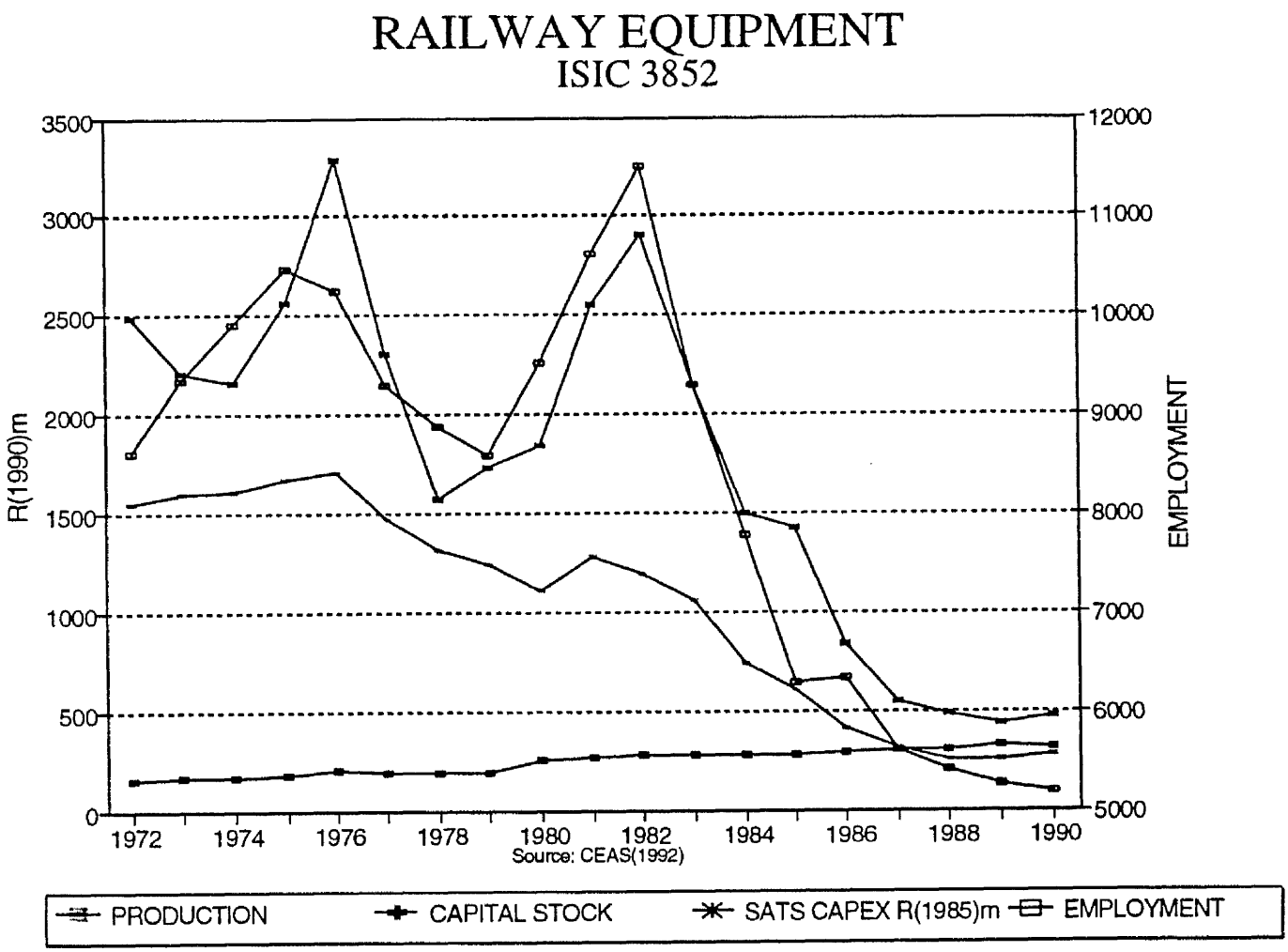
[56] The Financial Mail, 17-11-89, reported that variations of this mechanism was practiced by other firms. It was reported, for example, that a local shipping line was being investigated for exchange control contravention after it used an intermediary to buy Public Investment Commissioner controlled foreign debt at the prevailing 30% discount. The intermediary then lent the same shipping company domestic funds against the debt.

[57] Statements by Reserve Bank exchange control assistant General Manager, Alick Bruce-Band, reported in Sunday Tribune 15-11-92 and Business Day 8-1-93.

FIGURE 6.20 - ISIC 3852 RAILWAY EQUIPMENT KEY DATA



Source: CEAS (1992)

4.8.2 RAILWAY EQUIPMENT

From the mid-1950s up to the early 1980s, South Africa was one of the world's most important markets for railway equipment. The purchasing patterns of South African Railways, now Transnet, shaped the railway equipment manufacturing industry. Transnet capital expenditure mirrors the production profile for railway equipment, (figure 6.20). Approximately 20-35% of the total Transnet budget was spent on equipment between 1972 and 1990. Much of this was associated with MEC requirements, such as the Richards Bay line and Sishen-Saldhana line in the 1970s.

Declining expenditure after the completion of major rail infrastructure cascaded onto the equipment suppliers, resulting in the present low levels of activity. Imports of equipment and components also fluctuated in accordance with Transnet expenditure. For the first time in 1990, exports have exceeded imports. On a national basis, import propensity has fluctuated between 21-45% of production value since 1972 and is currently running at about 25%. Employment peaked at 11500 in 1982 and has declined since then to 5,200 in 1990, the bulk of which is in Transnet maintainance departments. The largest locomotive and coach manufacturer, Union Carriage employed about 700 people in 1990.

The railway equipment sector developed through an unfocused industrial policy to maximise backward industrial linkages using Transnet's purchasing power during a three decade period of infrastructure development (1950-80). Infrastructure completion led to the sector's output shrinking between 1982 and 1990 from R1.2b to R300m.

Conglomerate ownership of this sector only emerged in the 1980s. Until the mid-1970s Union Carriage and GEC Alsthom had a virtual monopoly on the supply of electric locomotives to Transnet, with GEC supplying the electrical equipment. In the 1960s, 50% of GEC UK's traction output was destined for South Africa. The volume of business justified a dedicated GEC traction equipment factory, manufacturing under licence, which was closed in 1984 as demand fell. At the time, import content of electrical equipment was between 5-10% by value.

Union Carriage was established as an Australian subsidiary in 1957, with production beginning in 1959. Since establishment, it has supplied 13,000 locomotives, coaches and wagons to SAR. In the mid-1980s, political pressure by the labour movement within Australia forced gradual disinvestment, the shares being taken up by Sanlam and Anglo American. In 1993, Union Carriage is a subsidiary of Standard Engineering which is in turn jointly owned by Malbak and Murray and Roberts. AAC holds a 28.5% share through AMIC.

With the growth of new technologies using AC traction, GEC have lost market share, from almost 100% between 1950-70 to 40-50% between 1970-90. General Motors (GM) used to supply diesel-electric locomotives from Port Elizabeth until disinvestment in 1986.[58] They were highly competitive, building on their mass production base in the US, and were able to import complete traction motors for less than the cost of GEC's unassembled materials domestically. More recently, Union Carriage have been making dual carriages, which are primarily electrically driven but have a diesel-electric capability.

Dorbyl Railway Products are the only other domestic manufacturer. They are considerably smaller than Union

[58] Diesel-Electric means that a diesel engine turns an alternator which supplies current to a traction motor. Such units are used on unelectrified lines.

Carriage, having supplied far fewer units of rolling stock since inception, compared to the former's 13,000. Previously, Dorbyl used to supply bogies to Union Carriage but secured an order from Transnet in 1984 for rolling stock, in an association with Hitachi. Transnet, at the time of shrinking markets, sought to support the creation of a second competitor. It appears that, like Escom's power station program, Transnet overestimated their equipment requirements, which led to sharp decline in orders in the late 1980s and a contraction of, for example, foundry output.

Part of the problem with the industrial strategy adopted was that access to the buoyant domestic market was only conditional on achieving a degree of local content. Instead, some conditionality should have been imposed regarding export markets. Today, like the motor industry, global sourcing patterns are followed in railway equipment manufacture. Thus, there is potential for railway component manufacturers to target the markets for bogies, gears, couplings and other components, many of which are ultimately sourced from the foundry industry. Australian National Industries bought EEC company, Aurora, and now export wheels and axles which are direct products from foundries. There is considerable potential for South Africa here since EEC foundries are closing down due to environmental considerations.

4.8.3 AIRCRAFT MANUFACTURE AND REPAIR

The Aircraft sector is split between commercial and military applications. The commercial activities are dominated by the national carrier South African Airways, whose purchases of whole aircraft and spares and maintenance activities are largely delinked from the domestic economy. The bulk of domestic aircraft

production relates to the assembly of military aircraft by the state-owned Atlas Aircraft Corporation.

Security considerations in the face of sanctions led the national carrier to purchase rather than lease its fleet and this had enormous balance of payment implications. Imports of R5.6b (1990 Rand) peaked in 1976, and again in 1989, reflecting both the purchase of several Boeing and Airbus jets as well as building military stocks, (figure 6.19). The entry of Flitestar, Comair and other competitors to SAA have had a lower impact since they have chosen to lease rather than purchase aircraft.

In addition to imports of whole aircraft, the country was reported to have used R240m of aircraft spares in 1989 of which 75% was imported. SAA's 1993 spares inventory stands at R720m in value, due largely to sanctions and none of these components are manufactured locally. Large corresponding investments were made in a very broad maintenance capability for the fleet at Jan Smuts Airport, raising overhead costs. For a relatively small airline in international comparison, SAA Technical Department's scope of maintenance activity under one roof is one of the most extensive in the world. About R130m of the technical department's R520-570m turnover in 1993 is for, mainly routine, third party work for other airlines calling at Jan Smuts. A smaller maintainance capacity for smaller aircraft exists in four other companies; Safair, Comair, Field Aviation and NAC.

Atlas assembly operations cycled according to South African Air Force (SAAF) orders for a series of aircraft. Between its establishment in 1964 and 1991, Atlas manufactured/assembled Italian designed Impala MkI and MKII jet fighters, Kudu and Bosbok light reconnaissance aircraft, Mirage jets, and Puma and Alouette helicopters. About 100 Impala jets and more than 100 helicopters were

built between 1983 and 1991. Each Impala, for example, was valued at about R7m and peak production was 12 planes per annum.

The import propensity of military aircraft is very high. While exact data are unavailable, all assembly was carried out under licence to foreign corporations (mainly French and Italian). It is known that Snecma (France) supplied engines for Mirage and Cheetahs which were made under licence to Dassault (France). Puma, Alouette and Super Frelon helicopters were licensed by Aerospatiale (France) with Turbomeca supplying turboshaft engines.[59] Numerous arms smuggling cases in Europe and the US, involving aircraft and aerospace components, indicate the extent of import dependence. While production may have peaked in 1975 at around R660m, in the same year R5.6b (1990 rand) of aircraft and components were imported. In that year SAA purchased six Boeing 747SP and two Boeing 747-200B Combi aircraft valued then at R233m or R1,435m in 1990. Thus approximately R4b of military equipment, probably in component and kit form, were imported in that year.

Despite the import dependence, a significant domestic design and manufacturing capacity has been developed, although much of this is still shrouded in secrecy. Apart from avionics, which falls outside this study, capability appears to exist in engine and aircraft design and production. This capability grew out of a targeted industrial strategy, involving the commitment of significant resources to research and development, co-ordinated by the military within the martial "total strategy" of the Botha regime.

Aircraft design, assembly and manufacturing capacity has been sustained by (now shrinking) defence expenditure. During the "total onslaught" framework of

[59] Business Day 25-6-91.

the Botha regime, this sector flourished under a tightly directed and well supported and co-ordinated industrial policy that focused major research and academic institutions around developing a design capability, capacity to reverse engineer, to develop advanced avionic systems and to make significant gains in materials technology, notably in the production and use of composite materials. Since 1990, the aircraft assembly/manufacturing segment has been abandoned to free-market forces. While the maintainance of the shrinking SAAF fleet is likely to provide a small constant baseload, the potential to build on past (and expensive) gains is rapidly diffusing.

There were at least four targeted developments in the 1980s that went beyond simple assembly, which form the nucleus of a potential aerospace industry today. These included helicopter design and manufacture; the capacity to reverse engineer, upgrading the ageing Mirage fleet with new radar, radar and mission performance accessories; a capability to design and produce jet turbine components such as blades in high precision foundry operations using single crystal vacuum furnace technology; and the capacity to design and develop the Ovid trainer and the Hummingbird observer aircraft made of composite materials.

The slashing of the defence budget in 1991 was the main factor in curtailing further development of the above projects. The fact that the projects incurred high costs and were uncompetitive was secondary, since projects of this nature take years to break even. In addition, airforce rationalisation has reduced the SAAF fleet from 775 to 390 aircraft and five of the twelve air bases have been closed,thus reducing the maintenance baseload on Atlas' activities.

As the state has embraced free-market policies, the co-ordinated and targeted "total strategy" around this sector has dissipated. Armscor reorganisation has split military and (mostly potential) civilian activities between Atlas Aircraft Corporation and Simera. Military sub-contractors involved in aircraft manufacture have attempted to organise themselves around the Aerospace Industry Representative Association of South Africa (Airasa). However, the considerable accumulated expertise in this industry is being allowed, in the absence of any coordination, to diffuse.

The SAAF's (originally) R220m replacement programme for one hundred ageing Harvard trainers was contested by an industry consortium who proposed the Ovid aircraft. However, in December 1992, the Cabinet awarded Pilatus of Switzerland the R520m contract for 60 PL-7 trainers. Even though the Pilatus PL-7 cost more, R5.5m/plane compared to R5.3m for the Ovid,[60] the reasons cited for this decision were that the Ovid was not fully developed and has yet to undergo the problems of tooling up and airworthiness certification. Pilatus, on the other hand, is in use by 22 airforces in the world and can be delivered immediately with established maintenance and simulation packages. Although Pilatus have offered a large amount (up to 55%) of offset work to Simera, it is anticipated that this will take the form of countertrade rather than be the site of the development of engineering equipment.

This issue has become quite controversial but whatever the merits of the various arguments, the lack of co-ordination between institutions involved is apparent, between Armscor as the sole military purchasing institution, SAAF as the user of the aircraft and the various parties within the industry association or consortium, who are attempting to institutionalise

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[60] Sunday Times 3-5-92.

themselves as the Aerospace industry. In the absence of a national industrial policy that covers this sector, the net result is likely to be the loss of one of the most technologically advanced segments of the engineering industry.

4.9 TRENDS IN FIRM SIZE AND OWNERSHIP STRUCTURE

The interdependence of different engineering sectors and their overall dependence on the MEC core has been illustrated above. In parallel with this, conglomerate control of the MEC core has been complemented by vertically and horizontally integrated control of all engineering sub-sectors.

Table 6.13 shows the extent to which the engineering sector is dominated by large firms and firm groups. This is particularly surprising for a sector like Fabricated Metal Products which is traditionally associated with smaller, often family-owned, workshops. Yet in 1985, 148 of the 2,865 firms active in the sector employed 49% of workers and produced 65% of output. Trends in rising ownership concentration are not reflected because the definition of "firms" above are based on productive units rather than plants with common ownership. No data were available after 1985, a period acknowledged as one when significant increases in ownership concentration took place and confirmed in several case studies in Rustomjee (1993),[61] where concentration is shown to be even greater than indicated in certain sub-sectors.

Many individual firms have been acquired and grouped within the six conglomerates that dominate the South African economy. Concentration is confirmed by firm level analysis, (table 6.14), showing the bulk of engineering

[61] For ISIC 371 see Hall Longmore case study; for ISIC 381 see Foundry Industry; for ISIC 382 see Earthmoving Equipment, Drilling Equipment; for ISIC 384 see Railway Equipment and Shipbuilding case studies.

activity carried out by publicly listed subsidiaries of the six conglomerates that dominate the economy, which, collectively account for more than 70% of engineering sector output and fixed assets.[62]

TABLE 6.13 - EMPLOYMENT, OUTPUT AND ASSETS OF TOP 5% OF FIRMS

ISIC SECTOR	No.of Firms (1)	% of Total Employ -ment	% of Total Gross Output	% of Total Assets
371 IRON & STEEL (1979)	8	75	78	88
371 IRON & STEEL (1982)	11	72	78	92
371 IRON & STEEL (1985)	10	71	77	88
Total Firms (1985)	192			
372 NON-FERROUS METAL (1979)	6	44	65	74
372 NON-FERROUS METAL (1982)	6	44	61	68
372 NON-FERROUS METAL (1985)	5	41	63	77
Total Firms (1985)	104			
381 FABRICATED METAL PRODS.(1979)	132	49	67	65
381 FABRICATED METAL PRODS.(1982)	148	51	64	66
381 FABRICATED METAL PRODS.(1985)	148	49	65	62
Total Firms (1985)	2,865			
382 MACHINERY (NON-ELECT.) (1979)	71	47	56	51
382 MACHINERY (NON-ELECT.) (1982)	88	54	62	68
382 MACHINERY (NON-ELECT.) (1985)	93	53	60	72
Total Firms (1985)	1,856			
384 TRANSPORT EQUIP.(NON MOTOR)(1979)	9	70	80	92
384 TRANSPORT EQUIP.(NON MOTOR)(1982)	11	69	74	69
384 TRANSPORT EQUIP.(NON MOTOR)(1985)	11	67	73	69
Total Firms (1985)	226			

Source: Census on Manufacturing, (1982) and (1985).

(1) Defined as "a legal entity consisting of one or more establishment...Premises under the same ownership or management in which one type of manufacturing activity is carried on is regarded as an establishment."

[62] This comparison of ISIC aggregates with published corporate data should be taken as indicative only. Firstly, some of the activities of the above corporations might lie outside the paper's definition of "engineering". Secondly, the valuation of fixed assets differs from company to company and may not have been depreciated at the same rate as used in ISIC calculations.

TABLE 6.14 - ENGINEERING SECTOR OWNERSHIP CONCENTRATION, 1990

	CONTROLLING INTEREST	TURNOVER 1990	FIXED ASSETS 1990
Barlow Rand (2)	SA Mutual	5,672	1,619
Metkor	Rembrandt/Iscor	3,164	670
Dorbyl	Metkor/AAC	2,844	601
Amic (1)	AAC	1,531	839
Anglovaal Industries (3)	Anglovaal	1,297	221
Haggie	Malbak/Gencor/AAC	1,254	279
Denel 1993(4)	Government	1,108	228
Murray & Roberts 1991(5)	Sanlam	817	340
Trencor	Directors/SA Mutual	785	88
Standard	Sanlam/Malbak/Gencor	691	119
E.L.Bateman	Directors	589	32
NEI Holding/Africa	NEI UK/SA Mutual	712	78
Cemenco	Trafalgar	356	74
Fraser Alexander		215	69
Farm-Ag	Rale	206	7
Fenner		209	26
Unihold		197	48
Toco		102	11
Titaco		89	3
Clyde		67	7
TPN		60	12
Smith Mining Equipment		45	5
ELECTRICAL (7)			
Powertech (6)	Venter/Altron	1,157	145
Altech (6)	Venter/Altron	397	60
Telemetrix (6)	Venter/Altron	72	11
Voltex	Elcentre	1,075	271
Grintek	Anglovaal	1,031	37
Delta	Delta PLC/AAC/SA Mutual	?	40
TOTAL		25,742	5,940
ENGINEERING SECTOR, ISIC ESTIMATE		36,142	7,656
% of Total		71%	78%

Source: McGregor (1993)

(1)AMIC Annual Report, 1990, Contribution of "engineering" subsidiaries estimated at 25% of group turnover and 20% group fixed assets.
(2)Barlow Rand Annual Report, 1990, "engineering" contribution to turnover and assets includes the following divisions; Electronics and electrical engineering (50%), Earthmoving equipment (100%), building materials (50%) and steel (100%). Barlow listed subsidiaries African Cables, Persetech and Reunert are included in holding company data and are not shown separately.
(3)Anglovaal Annual Report, 1990, Contribution of "engineering" subsidiaries estimated at 20% of group turnover and 20% group fixed assets.
(4)Rustomjee (1993). Turnover is likely to have been higher than indicated above in 1990.
(5)Murray and Roberts Engineering Annual Report, 1990. Murray and Roberts Engineering data are shown only.
(6)Holding companies Altron and Ventron are not shown. It is assumed that 50% of Altech activity relates to electrical (ISIC 383) and 50% to electronics (ISIC 385).

It is no coincidence that tariff protection policies tended to favour large-scale, vertically integrated capital. High effective levels of protection (ie on both inputs and outputs) have partly been driven by increasing conglomerate control of both upstream and downstream industries. In 1989, IDC estimates for Fabricated Metal Products, Electrical and Non-Electrical Machinery sectors were 17.1% protection on inputs, 18.2% on outputs and an effective protection level of 20.3%.[63] This has raised barriers to entry for independently-owned firms. Independent metal fabricators, for example, are disadvantaged in having to buy inputs from conglomerate-owned steel companies or steel merchants at high prices and then compete with another subsidiary of the same conglomerate in shrinking markets.

For domestic production, consumers of steel with ownership links through conglomerates or by being partly owned by Iscor (Eg. Dorbyl) are in the best position. They are followed by larger consumers of steel who, by virtue of size, have some muscle to negotiate favourable prices directly with the steel producers. Many smaller independent engineering firms are forced to buy steel through steel merchants, who handle about 40% of all steel sold domestically. Like many other sectors, merchant trade is dominated by three groups, Macsteel, Trident and Baldwins Steel(which is actually controlled by Dorbyl). Evidence is that the steel merchant price index has been consistently and significantly higher than, for example, the Iscor works price index. This is to be expected since merchants have to finance stockholdings and other off-cut wastage costs. However, there have been periodic complaints of price fixing among steel merchants with a call for investigation by the Competition Board.[64] One of the reasons cited by the

[63] IDC (1990).
[64] Sunday Times 22-9-91.

Competition Board in blocking the Haggie/NFM merger in 1993, was that it would lead to a monopoly in domestic copper scrap supply.

On the one hand, concentrated ownership is potentially beneficial in that it facilitates further concentrated investment and the achievement of economies of scale and scope. However, the evidence is that this has not been achieved, although the impact is mixed across sectors. Conglomerates have continued to focus on the MEC core as the main source of revenue and have not diversfied their engineering holdings out of a dependence on the MEC. Mergers and acquisitions by Sanlam, Old Mutual, AAC, Rembrandt and Anglovaal subsidiaries took place in the 1970s and 1980s without any clear sectoral or strategic focus. Fierce competition in a declining economy led to the wiping out of many small and independently-owned engineering firms. Some of these acquisitions are still being digested.

There is little evidence of any major improvement in the engineering arms of the conglomerates in the 1980s. Sectoral studies in Rustomjee (1993) show uncompetitive production in sector after sector until the late 1980s. Instead, a general contraction set in whereby conglomerate muscle was used to lobby for higher tariffs to make domestic sales more profitable. Most of the industry associations in existence today were formed in the early 1980s. Furthermore, the 1980s were characterised by greater interpenetration of conglomerates at holding company level, making focus more difficult.

The combination of conglomerate control and import parity pricing has contributed to stifling independent engineering sector activity. Several independent engineering companies have raised productivity and competitiveness after conglomerates were forced by GEIS

incentives to provide intermediate inputs at export parity prices. However, barriers to entry still disadvantage new players. They can only enter the market if they export, yet many of the export markets are dominated by conglomerate subsidiaries who export at marginal cost and who are in a better position to sustain a price war.

Despite this, some examples of success have been noted. However, their subsequent activity is to diversify into conglomerates themselves. This is illustrated by a recent move by Trencor. This independent engineering company which so successfully overcame such barriers to entry, chose to use its significant cash reserves, not to strengthen its engineering core or to shift focus within engineering, but to buy a small relatively independent conglomerate, W&A in February 1993.

Had there been an industrial strategy for the engineering sector, the obvious point in time to switch to an outward focus would have been in 1981 when unit costs of production were at their lowest, capacity utilisation was high and engineering skills, though limited, were in place. Here the studies of Bell and Trencor are instructive, for during that declining period, they focused outward whereas the increasing conglomerate control of engineering sectors focused inward, it being easier and more lucrative to engage in mergers and acquisitions in the shrinking domestic market.[65]

The two main sources of revenue for conglomerates declined simultaneously in the late 1980s. The fall in mining revenue and state-led GDFI led parent companies to force a degree of focus on to several of the engineering conglomerate groups. The greatest impact has probably

[65] This was despite the precedence of Boart, an internationally oriented drilling equipment subsidiary of AAC/De Beers since the 1960s.

been made by the restructuring of Sanlam's messy collection of engineering assets.[66] Murray and Roberts and Malbak have taken over and rationalised many of the engineering interests of Sankorp, the holding company of Sanlam's industrial interests, most of which were held by Federale Volksbeleggings. Major Murray and Roberts acquisitions have included Darling and Hodgeson, 38% of Standard Engineering (the balance held by Gencor's Malbak - also part of Sanlam) and Blue Circle Cement. Murray and Roberts's investment policy is described in its Annual Report, 1991, as "to acquire or establish businesses which have related technology or markets and which add value to Murray and Roberts's activities". Murray and Roberts has done this and reduced gearing between 1990 and 1992 from 22% to 14% through several sales of non-related activities. Capital intensity has risen over the same period from R705m to R1271m. Similar consolidation and refocus is taking place within AAC, Iscor and Rembrandt-owned Dorbyl.

In summary, unbundling and refocus has been underway even before 1993 budget proposals to encourage this process by taxing holding company dividends. Business analysts argue that in 1993, many engineering firms have become lean and are well placed to meet a period of growth. Excess capacity is very high. This means that, future growth may be met without any significant increase in capital expenditure. More importantly, should there be a need to increase capital investment in the engineering sectors, this might be facilitated by the peculiar form that South African conglomerates have taken, straddling mining, manufacturing and financial sectors.

However, the process described above has benefited conglomerates. The losers have been retrenched workers and a lost opportunity to enhance national development by preventing the destruction of engineering capacity after

[66] Financial Mail 6-3-92.

1981 and diversifying out of this into engineering activites independent of the MEC. The danger exists that, in the 1990s, the conglomerate-controlled engineering sector will continue narrowly to serve conglomerate-owned core MEC interests, thereby perpetuating the pattern of industrial history.

CONCLUSIONS

The MEC, while central to the economy, has been shown to have, firstly, driven developments in the engineering sectors and, secondly, to have been supported by such developments. Even so, the processes by which segments of the engineering industry developed have varied. Some sub-sectors, mainly Fabricated Metal Products (ISIC 382), developed as articulations of an expanding MEC core. Others, including industries within Non-Electrical Machinery (ISIC 383), Electrical Machinery (ISIC 383) and Transport Equipment (ISIC 385) grew upon demand for engineered goods. Yet others developed as part of tightly coordinated state strategies, either directly, for example, telecommunications within ISIC 383 or indirectly, in the case of armaments which stimulated a range of industries across ISIC 3800. However, in all cases, the driving force was linked to demands placed by core MEC sectors, either directly or indirectly. With few exceptions, the engineering sectors have not been able to develop an independence from the MEC.

Increasing conglomerate control of the South African economy is a characteristic of the MEC as a system of accumulation. It is prevalent across and between all major sub-sectors including mining, manufacturing and finance. In engineering, the particular form through which ownership evolved has been shown to have varied across the different engineering sectors. As with the development of MEC core sectors, the development of

engineering has involved both conflicting and complementary relations between state- and privately-owned corporations. Ownership has had a significant impact on engineering sector development.

Ownership concentration grew out of increasing vertical integration, particularly around the Basic Metal Industries. This was driven in the inter-war period by state-owned Iscor. The disjuncture between English and Afrikaner capital shaped the expansion of engineering activity and also impeded it from developing an independence from the MEC. The ownership pattern of engineering, namely vertical and horizontal integration is shown to have originated in this period. Iscor developed a number of vertically integrated joint ventures with foreign and domestic capital. But the disjuncture precluded the adoption of any more cohesive industrial policies for engineering until the sector was placed under martial control for war production, during which many engineering industries made enormous progress in scale and scope.

In the post-war period, although there were enormous gains in engineering output and widening diversity, the disjuncture still constrained diversification. English capital concentrated on developing the Free State Goldfields until the mid-1950s, while Afrikaner capital was involved in pooling finance and concentrating it in large-scale investments mainly in the MEC core sectors of mining and chemicals. In the absence of industrial policy for engineering, engineering sector development was shaped by traditional demands from mining and increasing demands from the broadening MEC core, namely from electricity, railway, oil and chemical industries. Iscor also continued to be influential in shaping engineering through its vertically integrated operations.

In the 1960s, with the increasing erosion of the disjuncture between English and Afrikaner capital, the former entered the Basic Metal Industries sector and vertically integrated operations with acquisitions made during the outflow of foreign capital in 1961. Even though some policy attempts were made to diversify out of the MEC, through the creation of the motor and telecommunications industries, for example, these policies were not cohesive enough and their success was precluded by the disjuncture and by changing and increasing demands from an expanding MEC core.

The rise in gold and energy prices in the early 1970s reversed attention back to the MEC core. Cohesive and extensive polices were adopted to considerably expand the core. Correspondingly, engineering activity grew in scale across all sub-sectors but there was no corresponding expansion of scope. So for example, the bulk of increased production from the Basic Metal Industries was exported and no cohesive industrial strategy emerged to foster downstream engineering use of such output. Instead, existing downstream industries became further integrated vertically into existing primary producers, without diversification out of dependency on the MEC.

Consequently, the slump that followed the exhaustion of the boom in the early 1980s led to drastic contraction across the entire engineering industry. This was accompanied by increasing mergers and acquisitions within conglomerate structures. Such concentration did not lead to rationalisation, increased investment and the seeking out of new export markets. Instead contraction continued according to MEC demand. Although there is considerable diversity across the engineering industry, an extensive interlinkage within the engineering industry has been demonstrated above, both in terms of material inputs and

outputs as well as in relations of ownership and industrial organisation.

The engineering sector then, needs to be viewed as a systemic whole within which the capacity of industry to produce complex machinery, or capital goods, is ultimately bound up. Thus, for policy purposes, a targeted sectoral policy for the automotive industry is unlikely to succeed unless it considers the capability of casting, forging and pressing support industries as well as the industries producing materials that flow through these plants and the capacity of the industry to maintain, modify and produce the machinery that is used.

Some significant but isolated developments in the engineering sectors have occurred despite the lack of any cohesive and supporting industrial policy. The examples of Trencor, Consani and Bell suggest that, were cohesive policies to be instituted, there is enormous potential to increase the output from engineering sectors.

Although present policy makers proffer support for capital goods production, the policies being implemented are no more cohesive than they have been in the past, given the lack of supporting infrastructure and institutions to allow such sectors to survive proposed policies of deregulation and protective tariff reductions. The prospects for the engineering sector to become the focal point for diversification out of the MEC in the 1990s is, therefore, very bleak indeed.

In the 1990s, history appears to be repeating itself. Increasing investments are flowing into the MEC core in anticipation of a revival in international commodity prices. Most conglomerates have rationalised their engineering sector holdings and are poised to benefit internally from increased domestic demand. There is, however, little evidence that the engineering

industry will go any way towards diversifying out of a dependence on the MEC core. As in the early 1970s, there are no cohesive policies to encourage this.

CHAPTER SEVEN

THESIS CONCLUSIONS

This thesis has ambitiously attempted to weave together a political economy of seventy years of industrialisation. This tapestry, though far from complete, offers an original (re)interpretation of the paths and processes through which industrialisation is understood to have traversed.

Both the conduct of policy, as reflected in numerous government department reports and Commissions of Inquiry, and the accompanying debates over industrialisation share a distorted understanding of what industrialisation has occurred and why. By drawing a false dichotomy between mining and manufacturing activities, the evolution of the MEC that straddles both has been overlooked. It has been too readily accepted that industrialisation has floundered on an ISI path that initially proceeded from protected consumer goods but failed to achieve international competitiveness and backward linkages. In contrast, this thesis argues that economic growth was based on expanding MEC core industries through the creation of forward linkages, but that this was not carried through to its full potential for the following reasons.

Firstly, secure industrialisation, while large in aggregate terms, is shown to has been confined to a number of core sectors around the Minerals-Energy Complex. Secondly, as a system of accumulation, the MEC has represented a complex and shifting relationship between English and Afrikaner fractions of capital, mediated through the state. The empowerment of Afrikaner capital and its interpenetration with English capital is shown to have underpinned the MEC as a system of accumulation. This had the effect of limiting industrial

policy to three relatively uncoordinated, and even incoherent, components, namely, the creation of state corporations, mainly around the MEC, the application of trade policy through tariff protection and, thirdly, policies of industrial decentralisation. While these policies have varied over time and across sectors, they were poorly monitored and never actively sought to diversify out of the MEC on a long term basis. The reasons for this include the failure to develop an industrial strategy based on the realities of the MEC and, even where coherent policy did emerge, it was subordinated to other objectives.

Thirdly, the existence of concentrated ownership of industry in South Africa is well-known. But the thesis has gone further than before in bringing out its implications. It shows that, while the relationship and outcomes have differed across sectors, the MEC has both contributed to, and been influenced by, the particular large-scale and conglomerated form into which capital has evolved and through which it wields power and influence in the South African economy.

State regulation of capital in general has been seen to have empowered large-scale capital. For example, although enacted in 1955, anti-monopoly legislation has never been used against the interests of large-scale capital. Instead, it was often employed to transform some of the conflictual relationships between English and Afrikaner fractions of capital into collusive ones, as in coal mining.

The state's direct investments in industry, while small in comparison to private sector holdings, have been concentrated over different periods of time in MEC core sectors such as steel and chemicals. These interventions have been shown to have been simultaneously the sites of the expansion of the MEC core, of the interpenetration of

English and Afrikaner capital and of the fostering of the development of large-scale capital.

The MEC, then, demonstrates a capability to carry through a significant industrial transformation of parts of the South African economy. But it has only done so on a piecemeal basis, exceptions that prove the rule as it were, for there has been an accompanying failure to diversify industrialisation away from MEC core sectors. This, in turn, exposes weaknesses in a number of generally accepted hypotheses. The argument that post-war industrialisation has conformed to a pattern of Import-Substituting Industrialisation (ISI) is shown to be misconstrued, differing from the industrial trajectory actually followed. In South Africa's case, industries which are supposedly "difficult" to substitute are shown to have expanded almost as fast as the industries which, according to ISI sequencing, come first because they are "easy" to substitute. This suggests that ISI may not be a useful methodology for analysing other developing economies. In any case, it is too descriptive, providing little analysis of <u>why</u> a particular pattern of industrialisation might or might not have evolved.

In addition, the buoyant hypothesis held by many observers in the 1970s and earlier, that South Africa had reached a stage of industrial "maturity" in Rostowian terms, is shown to be based on a recognition of gains made in and around the MEC. While Rostow's adherents expected these gains to be built upon by the forging of backward and forward linkages, the MEC hypothesis explains why differing circumstances prevented such an industrial policy from being carried through.

Thus, the prevailing hypotheses which downplay the capacity of a "peripheral" economy like South Africa to develop a domestic capital goods industry are shown to be false. Detailed study of the engineering industry has

revealed both its dependence on MEC core sectors and the existence of considerable capacity to produce a wide range of simple to complex capital goods, together with examples of some highly competitive exporters.

This indicates that both the process and extent of industrialisation in South Africa has been misunderstood. From the perspective of the MEC, this enormous capability to meet a wide range of needs of the MEC core, as evidenced by a number of successful exporters of complex capital equipment, is an indication of the latent potential of industry, even if it has remained dependent on the MEC core. The fact that it failed to develop a dynamic of its own is attributed to the political, economic and institutional aspects governing the MEC as it evolved over time.

Yet, instead of acknowledging the central role of the MEC, the academic discourse in South Africa is shown to have been impelled by the application of various theories of industrialisation and development in general, some of which have been less useful in interpreting causality in the process of industrialisation, as has been shown in the case of ISI theory for example. In addition past debates over industrialisation are shown to have been based on a partial and even false recognition of how industrial policy has been adopted and implemented in practice. For example, the lack of cohesion between the three main policy instruments used to shape industrialisation, namely creating and supporting state corporations, trade or tariff policy and industrial decentralisation has been overlooked. Much of the historiography has focused on individual policy components, or on the false dichotomy between mining and manufacturing, but never have the components been considered together in the context of the MEC.

This leads, finally, to the range of current debates which seek to proffer solutions to South Africa's supposedly weak manufacturing capability. The evidence in this thesis both questions the definition of "manufacturing" and reveals manufacturing sector "weakness" to be mixed across sectors and over time. Further, while weaknesses in manufacturing can be described at a particular point, they cannot be analysed without a comprehensive and historical understanding of linkages between the various sub-sectors of manufacturing and other sectors of the economy as well as the processes by which these have changed.

The challenges facing South African society, then, as it moves into a democratic era in the future are indeed as enormous as the achievements of the MEC in the past. Here, of crucial importance, will be the relative emphasis placed between either further developing the MEC core or attempting, once again, to diversify industry out of the strengths of MEC core sectors. Historically, it has been shown that several attempts were made by policymakers to achieve the latter, but these floundered for a variety of reasons; the disjuncture between economic power held by English capital and political power wielded by Afrikaner capital in the inter-war period, the focus on the development of Afrikaner capital and the Free State Goldfields in the 1950s; the interpenetration of English and Afrikaner capital in the 1960s around the MEC core which facilitated cohesive policies to expand MEC sectors following the gold and energy price rises in 1973; and, ultimately the end of this boom in the early 1980s when the apartheid system itself became increasingly susceptible to political challenges by disenfrachised South Africans and increasingly incapable of implementing coherent and co-ordinated industrial policies.

In the post-apartheid 1990s, there is no doubt that the power and influence of the MEC, through the conglomerates, will continue, as in the past, to make the greatest impact on the future trajectory of industrialisation in South Africa. A possible scenario is that, given the increasingly external orientation of the powerful conglomerates as well as the industrial policies favouring further MEC development, the South African economy could well revert to a dependence on primary commodities and primary processed commodity exports, facilitating conglomerate expansion externally. If the current policies of tariff reductions on non-MEC industries are carried through in the absence of any coherent industrial policy, de-industrialisation will take place with all the associated consequences. The economy will increasingly be subject to deteriorating terms of trade necessitating, as has been the case recently, corresponding exchange rate devaluations to bolster the profitability of MEC core sectors. More important, the nature of the large-scale and capital intensive industrialisation path means that formal sector employment will not grow significantly. Indeed, it is likely to decline with the contraction of non-MEC industries, as will the prospects for meeting the basic needs of South Africans.

On the other hand, there is an alternative scenario which presupposes that post-apartheid policymakers will recognise the cleavage at the sectoral level between the MEC core and non-MEC industries, and secondly, that their evolution is bound up with the particular form exhibited by large-scale capital through its interaction with various state-owned industries and state institutions. The enormous achievements of the MEC as a system of accumulation, in creating and expanding the MEC core, have been accompanied by a dependent but diversified set of non-MEC industries with considerable, but as yet

unrealised, potential as in the engineering sector for example.

The realisation of this potential will depend on the industrial policies adopted. Recognition of the cleavage based on the MEC will lead to at least three policy thrusts; one towards the MEC core sectors, one towards the non-MEC industries and an overarching set of policies to nurture the linkages between the two. Of necessity, this will require a mixture of incentives and coercion directed at the conglomerates, which by their concentrated, centralised and integrated form, are capable of, though unwilling to, carry through a diversification out of the MEC core.

Although large-scale private capital is not averse to accepting state support and guarantees for capital-intensive projects, in the present period of transition and in the global and domestic climate of deregulation and privatisation, it presents a collectively antagonistic front to any idea of coordinated state industrial policies. This does not mean that large-scale capital is opposed to coordination, but that the form taken will be unacceptable, should coordination usurp what are regarded as capital's prerogatives. Conglomerate behaviour thus continues to be a mixture of investment in export-oriented MEC core sectors through acquisition of privatised state-owned industries and some new investment whose profitablity is effectively underwritten by tax concessions and by the sheer magnitude of the capital committed. Capital flight continues to finance the off-shore expansion of several conglomerates.

Policymakers will thus have to challenge the power of corporate capital <u>without</u> undermining the capability of its organisational form to carry through an industrialisation that genuinely diversifies out of the

strengths of the MEC core and begins to meet the needs of those most affected by the legacy of apartheid.

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